Docket No. 2019-1557

In the

United States Court of Appeals

For the

Federal Circuit

MCRO, INC., dba Planet Blue,

Plaintiff-Appellant,

v.

BANDAI NAMCO GAMES AMERICA INC. and TREYARCH CORPORATION,

Defendants,

SONY COMPUTER ENTERTAINMENT AMERICA LLC, SUCKER PUNCH PRODUCTIONS, LLC, INFINITY WARD, INC., LUCASARTS, A DIVISION OF LUCASFILM ENTERTAINMENT COMPANY LTD. LLC, ACTIVISION PUBLISHING, INC., BLIZZARD ENTERTAINMENT, INC., NAUGHTY DOG, INC., ELECTRONIC ARTS, INC., DISNEY INTERACTIVE STUDIOS, INC. and SQUARE ENIX, INC.,

Defendants-Appellees.

Appeal from the United States District Court for the Central District of California in Case No. 12:12-CV-10322-GW-FFM, 2:12-CV-10329-GW-FFM, 2:12-CV-10333-GW-FFM, 2:12-CV-10335-GW-FFM, 2:12-CV-10338-GW-FFM, 2:14-CV-00332-GW-FFM, 2:14-CV-00336-GW-FFM, 2:14-CV-00352-GW-FFM, 2:14-CV-00358-GW-FFM and 2:14-CV-00383-GW-FFM · United States District Judge George H. Wu.

RESPONSE BRIEF OF DEFENDANTS-APPELLEES

August 23, 2019

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CERTIFICATE OF INTEREST

Counsel for Defendants-Appellees Electronic Arts Inc.; Activision Publishing, Inc.; Blizzard Entertainment, Inc.; and Infinity Ward, Inc. certify as follows:

1. The full name of every party represented by us is:

   Electronic Arts Inc.; Activision Publishing, Inc.; Blizzard Entertainment, Inc.; and Infinity Ward, Inc.

2. The name of the real party in interest represented by us is:

Parties Represented	**Real Party in Interest**
Electronic Arts Inc.	None
Activision Publishing, Inc.	None
Blizzard Entertainment, Inc.	None
Infinity Ward, Inc.	Activision Publishing, Inc.

3. All parent corporations and publicly held companies that own 10% or more of stock in the parties represented by us are:

Parties Represented	**All parent corporations and any public companies that own 10 percent or more of the stock of the party represented by us**
Electronic Arts Inc.	None
Activision Publishing, Inc.	Activision Blizzard, Inc.
Blizzard Entertainment, Inc.	Activision Blizzard, Inc.; Activision Entertainment Holdings, Inc.
Infinity Ward, Inc.	Activision Blizzard, Inc.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are

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Consolidated cases on appeal: *McRO, Inc. v. Bandai Namco Games America*, Case No. 2:12-cv-10322-GW-FFM (C.D. Cal.), lead case consolidated for pretrial purposes with *McRO, Inc. v. Electronic Arts Inc.*, Case No. 2:12-cv-10329-GW-FFM (C.D. Cal.); *McRO, Inc. v. Activision Blizzard, Inc.*, Case No. 2:14-cv-00336-GW-FFM (C.D. Cal.); *McRO, Inc. v. Infinity Ward, Inc.*, Case No. 2:14-cv-00352-GW-FFM (C.D. Cal.); *McRO, Inc. v. Disney Interactive Studios, Inc.*, Case No. 2:12-cv-10333-GW-FFM (C.D. Cal.); *McRO, Inc. v. LucasArts Entertainment Company LLC*, Case No. 2:14-cv-00358-GW-FFM (C.D. Cal.); *McRO, Inc. v. Naughty Dog, Inc.*, Case No. 2:12-cv-10335-GW-FFM (C.D. Cal.); *McRO. Inc. v. Sucker Punch Productions, LLC*, Case No. 2:14-cv-00332-GW-FFM (C.D. Cal.); *McRO, Inc. v. Sony Computer Entertainment America, LLC et al.*, Case No. 2:14-cv-00383-GW-FFM (C.D. Cal.); *McRO, Inc. v. Square Enix, Inc.*, Case No. 2:12-cv-10338-GW-FFM (C.D. Cal.).

DATED: August 23, 2019 DURIE TANGRI LLP

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1. The full name of every party or amicus represented by us is:

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LucasArts, a division of Lucasfilm Entertainment Company Ltd. LLC

2. The name of the real party in interest represented by us is:

None.

3. All parent corporations and any public companies that own 10 percent or more of the stock of the parties represented by us are:

Parties Represented	**All parent corporations and any public companies that own 10 percent or more of the stock of the party represented by us**
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LucasArts, a division of Lucasfilm Entertainment Company Ltd. LLC	Lucasfilm Ltd. LLC Disney Enterprises, Inc. The Walt Disney Company

4. The names of all law firms and the partners or associates that appeared for the parties now represented by us in the trial court or are expected to appear in this Court are:

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LucasArts, a division of Lucasfilm Entertainment Company Ltd. LLC	Evan Finkel; Carolyn S. Toto; James Chang; Sonal N. Mehta; Edward R. Reines; Evan N. Budaj; Justin M. Lee; Jack B. Blumenfeld; Rodger Dallery Smith, II; Pillsbury Winthrop Shaw Pittman LLP; Weil, Gotshal & Manges LLP; Morris Nichols Arsht and Tunnell LLP

5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this Court's decision in the pending appeal:

Consolidated cases on appeal: *McRO, Inc. v. Bandai Namco Games America*, Case No. 2:12-cv-10322-GW-FFM (C.D. Cal.), lead case consolidated for pretrial purposes with *McRO, Inc. v. Electronic Arts Inc.*, Case No. 2:12-cv-10329-GW-FFM (C.D. Cal.); *McRO, Inc. v. Activision Blizzard, Inc.*, Case No. 2:14-cv-00336-GW-FFM (C.D. Cal.); *McRO, Inc. v. Infinity Ward, Inc.*, Case No. 2:14-cv-00352-GW-FFM (C.D. Cal.); *McRO, Inc. v. Disney Interactive Studios, Inc.*, Case No. 2:12-cv-10333-GW-FFM (C.D. Cal.); *McRO, Inc. v. LucasArts Entertainment Company LLC*, Case No. 2:14-cv-00358-GW-FFM (C.D. Cal.); *McRO, Inc. v. Naughty Dog, Inc.*, Case No. 2:12-cv-10335-GW-FFM (C.D. Cal.); *McRO. Inc. v. Sucker Punch Productions, LLC*, Case No. 2:14-cv-00332-GW-FFM (C.D. Cal.); *McRO, Inc. v. Sony Computer Entertainment America, LLC et al.*, Case No. 2:14-cv-00383-GW-FFM (C.D. Cal.); *McRO, Inc. v. Square Enix, Inc.*, Case No. 2:12-cv-10338-GW-FFM (C.D. Cal.).

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1. The full name of every party or amicus represented by us is:

Parties Represented
Naughty Dog, Inc.
Sucker Punch Productions, LLC
Sony Computer Entertainment America LLC

2. The name of the real party in interest represented by us is:

Sony Interactive Entertainment LLC

3. Parent corporations and publicly held companies that own 10% or more of the stock in the parties represented by us are:

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Sucker Punch Productions, LLC	Sony Interactive Entertainment LLC; Sony Corporation
Sony Computer Entertainment America LLC	Sony Corporation of America; Sony Corporation

4. The names of all law firms and the partners or associates that appeared for the parties now represented by us in the trial court or are expected to appear in this Court (**and who have not or will not enter an appearance in this case)** are:

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5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal.

Consolidated cases on appeal: *McRO, Inc. v. Bandai Namco Games*

America, Case No. 2:12-cv-10322-GW-FFM (C.D. Cal.), lead case consolidated for pretrial purposes with *McRO, Inc. v. Electronic Arts Inc.*, Case No. 2:12-cv-10329-GW-FFM (C.D. Cal.); *McRO, Inc. v. Activision Blizzard, Inc.*, Case No. 2:14-cv-00336-GW-FFM (C.D. Cal.); *McRO, Inc. v. Infinity Ward, Inc.*, Case No. 2:14-cv-00352-GW-FFM (C.D. Cal.); *McRO, Inc. v. Disney Interactive Studios, Inc.*, Case No. 2:12-cv-10333-GW-FFM (C.D. Cal.); *McRO, Inc. v. LucasArts Entertainment Company LLC*, Case No. 2:14-cv-00358-GW-FFM (C.D. Cal.); *McRO, Inc. v. Naughty Dog, Inc.*, Case No. 2:12-cv-10335-GW-FFM (C.D. Cal.); *McRO. Inc. v. Sucker Punch Productions, LLC*, Case No. 2:14-cv-00332-GW-FFM (C.D. Cal.); *McRO, Inc. v. Sony Computer Entertainment America, LLC et al.*, Case No. 2:14-cv-00383-GW-FFM (C.D. Cal.); *McRO, Inc. v. Square Enix, Inc.*, Case No. 2:12-cv-10338-GW-FFM (C.D. Cal.).

DATED: August 23, 2019 SHOOK, HARDY & BACON LLP

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CERTIFICATE OF INTEREST

Counsel for Defendant-Appellee Square Enix, Inc. hereby certifies as follows:

1. The full name of every party represented by us is:

   Square Enix, Inc.

2. The name of the real party in interest represented by us is:

   Square Enix, Inc.

3. All parent corporations and any public companies that own 10 percent or more of the stock of the parties represented by us are:

   Square Enix, Inc. is a wholly owned subsidiary of Square Enix of America Holdings, Inc., which in turn is a wholly owned subsidiary of Square Enix Holdings Co., Ltd., a publicly traded corporation. No other corporation is a parent or owns 10 percent or more of appellee Square Enix, Inc.

4. The names of all law firms and the partners or associates that appeared for the parties now represented by us in the trial court or are expected to appear in this Court are:

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5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this Court's decision in the pending appeal:

   Consolidated cases on appeal: *McRO, Inc. v. Bandai Namco Games America*, Case No. 2:12-cv-10322-GW-FFM (C.D. Cal.), lead case consolidated for pretrial purposes with *McRO, Inc. v. Electronic Arts Inc.*, Case No. 2:12-cv-10329-GW-FFM (C.D. Cal.); *McRO, Inc. v. Activision Blizzard, Inc.*, Case No. 2:14-cv-00336-GW-FFM (C.D. Cal.); *McRO, Inc. v. Infinity Ward, Inc.*, Case No. 2:14-cv-00352-GW-FFM (C.D. Cal.); *McRO, Inc. v. Disney Interactive Studios, Inc.*, Case No. 2:12-cv-10333-GW-FFM (C.D. Cal.); *McRO, Inc. v. LucasArts Entertainment Company LLC*, Case No. 2:14-cv-

00358-GW-FFM (C.D. Cal.); *McRO, Inc. v. Naughty Dog, Inc.*, Case No. 2:12-cv-10335-GW-FFM (C.D. Cal.); *McRO. Inc. v. Sucker Punch Productions, LLC*, Case No. 2:14-cv-00332-GW-FFM (C.D. Cal.); *McRO, Inc. v. Sony Computer Entertainment America, LLC et al.*, Case No. 2:14-cv-00383-GW-FFM (C.D. Cal.); *McRO, Inc. v. Square Enix, Inc.*, Case No. 2:12-cv-10338-GW-FFM (C.D. Cal.).

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TABLE OF ABBREVIATIONS AND CONVENTIONS

Abbreviation	**Meaning**
"'278 Patent"	U.S. Patent No. 6,611,278 (Appx56-67)
"Appellees"	Individually or collectively, Defendants-Appellees Activision Publishing, Inc.; Blizzard Entertainment, Inc.; Infinity Ward, Inc.; Electronic Arts, Inc.; Disney Interactive Studios, Inc.; LucasArts, a Division of Lucasfilm Entertainment Co. Ltd. LLC; Square Enix, Inc.; Sony Computer Entertainment America LLC; Sucker Punch Productions, LLC; Naughty Dog, Inc.
"BALDI"	BALDI Facial Synthesis Software version 42
"BB"	McRo's Blue Brief in this appeal
"McRo" or "Appellant"	Plaintiff-Appellant McRo, Inc., dba Planet Blue
POSITA	person of ordinary skill in the art
Section 101	35 U.S.C. § 101
"Section 101 Appeal"	Consolidated Appeal Nos. 2015-1080, -1081, -1082, -1083, -1084, -1085, -1086, -1087, -1088, -1089, -1090, -1092, -1093, -1094, -109
Section 112	35 U.S.C. § 112
"Pelachaud"	Catherine Pelachaud, *Communication and Coarticulation in Facial Animation*, A Dissertation in Computer and Information Science, Presented to the Faculties of the University of Pennsylvania in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy (1991)

STATEMENT OF RELATED CASES

An appeal in the same actions was previously before this Court. *See McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016) (Lead Consolidated Appeal No. 15-1080) (Reyna, Taranto, and Stoll, JJ.) (decided September 13, 2016).

COUNTERSTATEMENT OF ISSUES

1. Should summary judgment of non-infringement be affirmed because McRo waived its only objection to the District Court's construction of "morph weight set"?

2. Should summary judgment of non-infringement be affirmed because the District Court correctly construed "morph weight set" to require delta sets represented by vectors in three-dimensional space?

3. Should summary judgment of non-infringement be affirmed because the accused products cannot infringe as a matter of law even on McRo's preferred construction of "morph weight set"?

4. Should summary judgment of invalidity be affirmed because the District Court correctly found that the specification's narrow disclosure of one specific type of ruleset failed to enable the full scope of the term "first set of rules" under the claim construction McRo sought and obtained?

COUNTERSTATEMENT OF THE CASE

McRo's patented invention "uses a combined order of specific rules that renders information into a specific format that is then used and applied to create desired results: a sequence of synchronized, animated characters." *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1315 (Fed. Cir. 2016). The disputes on remand from a prior appeal concerned what that "***specific format***" must be, and whether the '278 Patent enabled the full scope of the "specific rules" that the claims recite. On summary judgment, the District Court found that the asserted claims did not cover the animation method practiced by Appellees' accused systems, and that the specification's disclosure of particular rule types did not enable the full scope of the claimed rules.

I. THE PATENTED INVENTION AND CLAIMS

The '278 Patent claims a method of using "mathematical rules" to automate a prior art technique that generates an animated character whose lips move in sync with dialogue. *McRO, Inc.*, 837 F.3d at 1314. The prior appeal addressed whether the '278 Patent's "automatic use of rules of a particular type" meant that its claims were directed to patent-ineligible subject matter. *Id.* The prior appeal thus dealt primarily with the question of what the claimed rules ***are***. This appeal concerns what those rules ***do***.

Claim 1 of the ’278 Patent is the only independent claim asserted and is representative for all issues on appeal:

> A method for automatically animating lip synchronization and facial expression of three-dimensional characters comprising:
>
> obtaining **a first set of rules** that defines a **morph weight set** stream as a function of phoneme sequence and times associated with said phoneme sequence;
>
> obtaining a plurality of sub-sequences of timed phonemes corresponding to a desired audio sequence for said three-dimensional characters;
>
> generating an output **morph weight set** stream by applying said first set of rules to each sub-sequence of said plurality of sub-sequences of timed phonemes; and
>
> applying said output **morph weight set** stream to an input sequence of animated characters to generate an output sequence of animated characters with lip and facial expression synchronized to said audio sequence.

Appx66 at 11:43-59.[1]

The rules of the claimed invention employ ***morph weight sets***, a prior art concept. The prior art practice “for three dimensional computer generated speech animation is by manual techniques commonly using a ‘morph target’ approach.” Appx61 at 1:48-50. The morph target approach manipulates a “reference model of a neutral mouth position” along with models of “several other mouth positions,”

[1] Emphasis added and internal citations omitted throughout, unless noted.

known as "morph targets." Appx61 at 1:50-59. "Each morph target has the same topology as the neutral model, the same number of vertices, and each vertex on each model logically corresponds to a vertex on each other model, [f]or example, vertex #n on all models represents the left corner of the mouth, and although this is the typical case, such rigid correspondence may not be necessary." Appx61 at 1:54-59.

Morph weight sets operate on the morph targets to obtain the character's desired appearance via mathematical operations that permit the animator to achieve the desired final state of the model. First, a "delta set" is defined for each morph target to create a representation of the morph target pose that can be manipulated by the morph weight set: "The deltas of each vertex on each morph target relative to the neutral are computed as ***a vector from each vertex n on the reference [model] to each vertex n on each morph target***. These are called the delta sets." Appx61 at 1:60-64. Thus, a delta set is a collection of vectors, each specifying a displacement from one point in three-dimensional space ("each vertex n on the reference [model]") to another ("each vertex n on each morph target"). Appx61 at 1:61-62.

A morph weight constitutes a ***weight*** assigned to the delta set of each morph target, "a value usually from 0 to 1," that specifies the intensity with which that morph target is expressed in the model's desired state. Appx61 at 1:65-67, 2:14-25. Each morph weight is applied to the vectors of the delta set to which it pertains, and the corresponding vectors of each weighted (*i.e.*, augmented by the morph weight

having been applied to it) delta set are added together to achieve the model's desired state. The specification explains:

> From these morph weights, the neutral's geometry is modified as follows: ***Each vertex N on the neutral has the corresponding delta set's vertex multiplied by the scalar morph weight added to it.*** This is repeated for each morph target, and the result is summed. ***For each vertex v in the neutral model:***
>
> $$|\text{result}| = |\text{neutral}| + \Sigma_{x-1}^{n} |\text{delta setx}| \text{morph weigh}$$
>
> ***where the symbol |xxx| is used to indicate the corresponding vector in each reference set.*** For example, |result| is the corresponding resultant vertex to vertex v in the neutral model |neutral| and |delta setx| is the corresponding vector for delta set x.

Appx61 at 1:67-2:13.

According to the specification, in the prior art, the artist needed to set the morph weights at each frame. Appx61 at 2:26-35. The "keyframe" approach, where the artist sets the morph weights manually only at important frames with the system automatically interpolating the remainder, provided some assistance, but was "tedious," "time consuming," and "inaccurate." *Id.*

The claimed invention sought to automate this process of generating morph weight sets using rules. The claimed rules define a morph weight set stream "as a function of phoneme sequence and times associated with said phoneme sequence." Appx66 at 11:46-48. The rules take a phoneme sequence and accompanying timings (*e.g.*, the phoneme and time breakdown for "hello," *see* Appx64 at 8:44-55) and

generate a set of morph weights, one for each delta set, at particular times in the resulting animation (a stream). An example of this output begins in column 8 of the specification. Appx64-65 at 8:55-9:14. The claimed method requires obtaining the rules, phonemes, and timings of the phrase to be animated; using the rules and the phoneme transcript to generate the morph weight set stream for the animation; and applying the morph weight set stream to the sequence of animated characters to obtain an "output sequence of animated characters with lip and facial expression synchronized to said audio sequence." Appx66 at 11:56-59.

The specification states that the required set of rules "must be completely specified for any sequence of phonemes and times encountered." Appx62 at 4:58-59. It does not, however, provide a set of rules to build such a system. Instead, it provides a few exemplary rules and some general guidance for how to create further rules. Though the claims cover all rules having the characteristic of defining a morph weight set stream as a function of phoneme sequence and times associated with said phoneme sequence, the specification's guidance and its disclosure of available rule types are more limited. The specification's description of the rules, including every example provided, teaches that the rules must specify the correspondence between the phoneme subsequences and the morph weight sets at certain specific times ("correspondence rules"), and must specify the parameters for transitioning between the keyframes generated by the correspondence rules ("transition rules"). Appx62-

64; Appx66 at 4:1-11, 4:52-57, 5:5-12, 5:25-28, 5:45-65, 6:33-43, 6:44-65, 7:55-8:40, 11:22-28.

The specification does not suggest that its small set of exemplary rules (approximately twenty rules, *see* Appx64-66 at 7:55-11:10) would be sufficient to build a working system—*i.e.*, that they would enable the processing of "any sequence of phonemes and times encountered." Appx62 at 4:58-59. Instead, "[t]he rules of the present invention are ***extensible and freeform*** in the sense that they may be ***created as desired and adapted to a wide variety*** of animation characters, situations, and products." Appx65 at 9:28-31. Each of the exemplary rules follows the structure described above: correspondence rules generating morph weight sets at keyframes, and rules specifying the timing of transition between them. Each of the rules also takes the form of an "if . . . then" logic statement—***if*** certain phonemes are encountered, or are encountered in a particular order, ***then*** certain morph weight sets are generated or certain transition parameters are applied. Appx65 at 9:31-32.

II. CLAIM CONSTRUCTION

A. "Morph Weight Set"

During claim construction (before the first appeal), the parties and the District Court addressed the meaning of "morph weight set." Both sides presented views consistent with their positions in this appeal. Appellees proposed a construction of "morph weight set" that required a correspondence between each morph weight and

delta set, and specified that the delta set must consist of a set of vectors defining the displacement of each vertex on the morph target relative to its position on the neutral model:

> [A] set of values, one for each delta set, that, when applied, transform the neutral model to some desired state such as speaking the "oo" sound or the "th" sound, where there is one delta set for each morph target comprising the vectors that define the position change for each vertex in the morph target relative to the position of the same vertex in the neutral model.

Appx749.

McRo sought a construction that attempted to muddy the definition of a morph weight set and corresponding delta set:

> A set of values, one for each delta set that, when applied, transform the neutral model to some desired state, wherein each delta set is the mathematical representation of the difference between the neutral model and another model.

Appx697-700. In seeking its definition of "delta set" as any "mathematical representation of the difference between the neutral model and another model," McRo made the same argument to the District Court that it presents here—that a delta set can be defined by ***any*** "vector" meeting the broadest mathematical definition of that term ("an ordered list of numbers"). In particular, McRo argued that, although it did not think "delta set" needed to be defined, as a "compromise," it incorporated into its construction the term "'***mathematical representation***' which

is ***consistent with the operation of the 'vector' in the definition of 'delta set.***'" Appx795.

At the *Markman* hearing, the District Court's tentative ruling rejected McRo's definition of "vector" as any "mathematical representation":

> But the Court would agree with Defendants that this is not an innocuous "simplification," but rather, a significant generalization. . . . [T]he specification teaches that the delta sets are ***comprised of vectors from each vertex on the neutral model to each corresponding vertex on the morph target.*** Plaintiff provides ***no reason to deviate*** from the specification's express definition.

Appx8246. The District Court accordingly proposed to construe "morph weight set" as "[a] set of values, one for each delta set, that, when applied, transform the neutral model to some desired state, wherein each delta set is the set of vectors from each vertex on the neutral (reference) model to each vertex on a model of another mouth position." Appx8246-8247 (emphasis original).

McRo did not object to the tentative ruling rejecting its "mathematical representation" argument:

> [THE DISTRICT COURT]: So let's start with the Markman itself at this point. How do you guys want to do it? . . .
>
> [MCRO'S COUNSEL]: . . . [T]he best way to proceed is that ***we have no objection to your Honor's tentative.***

Appx229 at 39:6-14. Because Appellees prevailed on the term and McRo stipulated to the construction, there was no oral argument on this key limitation. *See generally*

Appx229-304 (arguing only Appellees' chosen terms, which did not include "morph weight set"); *see also* Appx246-247 at 56:25-57:9 (District Court noting that there was no need for Appellees to address the "morph weight set" limitation because McRo had no objections to the tentative ruling). When the District Court issued its final construction for "morph weight set," the relevant part of the opinion was unchanged, based on McRo's acquiescence. Appx902. McRo did not object or seek reconsideration, or raise this in the first appeal.

B. "First Set Of Rules"

At claim construction, Appellees also attempted to limit the claimed "first set of rules" based on the claim language and intrinsic record. Appellees explained that the claimed "first set of rules" needed to be a group of logic statements (*e.g.*, the "if . . . then . . . else" format to which every rule in the specification conforms) that are embodied in a computer software program and used together. Appx760-762. McRo argued that the "first set of rules" should be construed as simply "a group of instructions." Appx706-709; Appx803-806. As Appellees pointed out, "if 'first set of rules' can be any amorphous 'group' of 'instructions,' it adds nothing to the claim," since ***any*** source code or algorithm that generates a morph weight set stream from a set of phonemes and timings would satisfy that construction. Appx760-761.

The District Court rejected both proposals, concluding that no construction was necessary. Appx907-909.

III. FIRST APPEAL AND REMAND

After claim construction, Appellees moved for judgment on the pleadings, arguing that the claims as construed were invalid because they were directed to the abstract idea of using rules to generate morph weight sets, and the claimed rules could not constitute a meaningful inventive concept after McRo and the District Court had rejected any limitation on what those rules could be. Appx8273-8281. The District Court agreed, finding that because the patent added to the prior art only "the use of rules, rather than artists, to set the morph weight sets and transitions between phonemes," and because the rules were "specified at the highest level of generality" and left to the user to define, the claim constituted the abstract idea of using rules and an instruction to apply that idea using a computer. Appx1070-1071.

McRo appealed. And on appeal, it shifted course on the scope of the "first set of rules." Rather than telling this Court, as it had told the District Court, that a "set of rules is, quite simply, a set of instructions," McRo wrote that "[w]hat sets the invention apart" is that the claimed rules "***automatically*** determine[] when to set keyframes, the appropriate morph weight set at each keyframe, and how the animation should transition between keyframes." Appx1380 (emphasis original).

This Court reversed, and held that the claimed first set of rules, in "automat[ing] a 3-D animator's tasks, specifically, determining when to set keyframes and setting those keyframes," constituted a sufficiently concrete

improvement to the art of computer animation for patentability. *McRO*, 837 F.3d at 1307, 1313-15. This Court found the claimed rules to be a "genus" defined by the characteristics recited in the claim. *Id.* at 1313. This Court explained that the requirements of patentees seeking to claim a genus are not expressed in terms of Section 101 doctrine, but instead "whether the patentee has satisfied the tradeoff of broad disclosure for broad scope implicit in 35 U.S.C. § 112." *Id.* at 1313-14.

On remand, Appellees sought a supplemental claim construction limiting the term "first set of rules" consistent with McRo's representation to this Court that the claimed rules determine morph weight sets at keyframes and define the transitions between them. Appx969-971. The District Court declined to issue a supplemental construction, but recognized that the lack of limits on the "first set of rules," and the specification's scant disclosure about their content, might have consequences under Section 112. Appx2787-2790.

IV. INFRINGEMENT ALLEGATIONS

On remand, the District Court's prior construction requiring that "morph weight sets" correspond to "delta sets" represented as "the set of vectors from each vertex on the neutral (reference) model to each vertex on a model of another mouth position" presented a fatal problem for McRo. Appellees' accused systems used third-party software tools (FaceFX or Annosoft) to create a "speech target curve" corresponding to each of a set of "speech targets," which are facial models created

by an animator in modeling software. *See, e.g.*, Appx4664-4672; Appx5956-5962; Appx6067-6068; Appx4649. The speech target curve values would be used to blend the speech targets together at each point in the animation to make it appear that the character was speaking the words in the audio file provided to the software tool. *See, e.g.*, Appx6073; *see also* Appx5953; Appx5956-5958; Appx4664-4673. However, the undisputed evidence showed that the speech target curves were not applied to, and did not operate on, a set of vectors from each vertex on a neutral (reference) model to each vertex on a model of another mouth position. *See, e.g.*, Appx5956-5962; Appx5966; Appx5989-5990; *see also* Appx4664-4666; Appx5022-5023 at 280:8-281:4; Appx5026-5028 at 294:25-301:1. Instead, the speech target curves operated on a set of structures called "bones." Appx5958-5959; *see also* Appx6067-6068; Appx6094; Appx4648-4651.

"Bones" are unrelated to the character's physical bones. They are abstract mathematical control objects that can be manipulated by an animator to adjust the facial model without having to worry about the movement of individual vertices. Appx4648-4651; Appx5952. Bones are specified by a set of values representing translation, rotation, and scaling transformations for the bones. Appx4650; Appx5952-5953. Those values, combined with additional information for how the vertices on the facial model map to the bones, ultimately provide the location of each

vertex on the computer-generated face. Appx4988-4989 at 141:12-145:8; Appx5954; Appx6071; Appx6081-6082.

The accused process for generating lip-synchronized facial animation in Appellees' video games is indifferent to the location of the vertices on either the neutral model or on any facial model. Appx4649-4650; Appx5957-5959; Appx5981-5982; Appx5989-5990. The "speech target curves" accused of being the morph weight sets correspond to bone poses, and operate on bone transform values. Appx4664-4666; Appx5956-5960; Appx5963-5966. Bone transform values ***do not*** constitute "vectors ***from each vertex on the neutral (reference) model to each vertex on a model of another mouth position***," because they do not specify, or even contain enough information to derive, the position or the displacement of any vertex on any facial model. Appx6071; Appx6081-6082; Appx4988-4989 at 141:12-145:8; Appx5021 at 275:13-276:2; Appx5954. And the information regarding the actual positions of the vertices is not manipulated or involved in the accused process. Appx6114; Appx4664-4666; Appx4683 (acknowledging that facial models are exported out of the modeling tool as bone transforms); Appx4695 (same); Appx4719 (same); Appx5953-5954; Appx5973; Appx5981-5982. Instead, it is provided to the system ***after*** the lip synchronization process is completed, to make the animated facial model appear on the screen. Appx6114-6115; Appx4650-4651; Appx4664-

4666; Appx5953-5954; Appx5959; Appx5963-5966; Appx5972-5973; Appx5981-5982.

Faced with a fundamental mismatch between the claimed invention and the accused bones animation technique, McRo repeatedly tried to state a viable infringement theory. Each was (rightly) rejected by the District Court. McRo now argues to this Court that the "bones animation" process nonetheless infringes because the bone transform values meet the definition of a delta set. On McRo's current theory, this is so because any ordered list of numbers is a "vector" in mathematics, and because the ten-value "vector" constituting the bone transforms on which the speech target curves operate is "associated with changes of vertex positions." BB at 29-32.

This theory did not appear in McRo's Fed. R. Civ. P. 26 expert report on infringement. In that report, McRo's technical expert, Dr. Michael Gleicher, reasoned that under the construction of "morph weight set," a "delta set" had two requirements: (1) a delta set "requires that there are two models of the face/mouth: a Neutral model, and 'another' model"; and (2) a delta set "also requires that each of the models has a corresponding set of vertices, otherwise there cannot be a vector between each vertex on the Neutral and Delta models." Appx4659. From this, Dr. Gleicher reasoned that delta sets existed ***inherently*** in the accused systems because the offline process of creating the speech targets for use in the accused process

involved an animator deforming a "reference pose" into a set of speech target poses. *See, e.g.*, Appx4659-4660; Appx4682-4683; Appx4713. In this scenario, Dr. Gleicher theorized that "[t]he requirement for a vector between each corresponding pair of vertices is always met because every pair of vertices defines a vector (via subtraction)." Appx4659-4660.

While the "Technical Background" section of Dr. Gleicher's report contained a high-level description of bones animation, and set forth the view that the bone transformation values constituted a "delta vector" (whatever that means), nowhere did Dr. Gleicher opine that the "delta set" requirement of the District Court's "morph weight set" construction was satisfied by the set of bone transform values in any accused game. Appx4649-4650.

V. SUMMARY JUDGMENT

A. Non-Infringement

Appellees moved for summary judgment of non-infringement on the theory in Dr. Gleicher's expert report. Appellees argued that the claims and the District Court's construction required McRo to locate in the accused games the "delta sets" to which the claimed "morph weight sets" correspond, and that McRo could not meet this burden by asserting that the accused "delta sets" are merely conceptual. Appx4072-4079. Presumably recognizing that its own expert's theory could not withstand summary judgment, McRo pivoted to its current theory—that the "delta

set" requirement is satisfied by the transform values used by the bone transformation systems in the accused games. Appx6142-6151. For support, McRo primarily cited to a declaration submitted by its expert earlier in the case, before he had performed any infringement analysis on the accused games. Appx6142-6147. In that declaration, Dr. Gleicher had hypothesized that the bone transformations could be "vectors" that could hypothetically satisfy the District Court's definition of "delta set." Appx2298-2299. Dr. Gleicher's expert report did not include or even incorporate by reference the material in that declaration.

On reply, Appellees explained that McRo could not survive summary judgment based on an opinion not contained in Dr. Gleicher's report (and thus inadmissible at trial). Appx7296-7302. However, the District Court rejected McRo's argument on the merits. In finding that bones animation did not infringe, the District Court confirmed that when it construed "morph weight set" as a set of values corresponding to "delta sets" composed of "the set of ***vectors from each vertex on the neutral (reference) model to each vertex on a model of another mouth position***," it required vectors representing the change in the position (direction and magnitude) of each vertex in three-dimensional space, not vectors in the abstract mathematical sense of "any ordered list of numbers." Appx13-21.

Critically, the District Court found that McRo's urging of that abstract mathematical sense of "vector" was a rehash of the argument the District Court had

rejected at claim construction—*i.e.*, that the "set of vectors from each vertex on the neutral (reference) model to each vertex on a model of another mouth position" was the equivalent of "mathematical representation of the difference between the neutral model and another model." Appx17. Consistent with its prior ruling, the District Court again explained that the specification shows that the inventor defined "delta sets" as a set of vectors in three-dimensional space, and that the patented invention taught in the specification involved manipulating them in that format to reach the desired result. Appx13-21.

B. Invalidity

In the tentative ruling on summary judgment, consistent with its suggestion after remand, Appx2789-2790, the District Court requested briefing on whether the "first set of rules" limitation was enabled under Section 112. Appx8. Appellees demonstrated that the patentee's broad claim to a genus of "rules," under the boundless construction of the term that McRo had successfully advocated, meant that the full scope of the claims was not enabled. Appx7544-7561. In particular, Appellees established that the specification teaches only two narrow species of rules: "correspondence rules" (which set up a correspondence between certain phonemes and phoneme sub-sequences and certain morph weight sets at keyframes) and "transition rules" (which set parameters for morph weight sets), both defined as simple "if. . . then . . . else" logic statements. Appx7546-7549; Appx7554-7556.

Appellees relied on the testimony of their expert, Dr. Wyvill, that this narrow disclosure of exemplary rules would not have permitted a POSITA to develop a working system that practiced the claims without undue experimentation. Appx7551-7552; Appx7556-7560.

The District Court agreed, crediting Dr. Wyvill's testimony in concluding that the specification's sparse disclosure of basic correspondence and transition rules would not have given a POSITA "the tools to practice the full scope of the 'first set of rules' limitation . . . without undue experimentation." Appx42-43. The District Court also found that the responsive testimony of McRo's expert either applied the incorrect legal standard or improperly relied on prior art to supply the required disclosure. Appx44-47. The District Court then applied the *Wands* factors to "further confirm" that the asserted claims were not enabled as a matter of law. Appx47-52.

SUMMARY OF THE ARGUMENT

Summary judgment of non-infringement and invalidity should be affirmed for multiple independent reasons.

Non-Infringement. McRo's sole basis for seeking to overturn the District Court's non-infringement ruling is that the District Court supposedly erroneously construed the term "morph weight set" to require "delta sets" represented by a set of vectors in three-dimensional space. This argument fails because McRo has waived it; it is wrong on the merits; and it would not affect the outcome even if it were correct.

Waiver. During claim construction, McRo argued to the District Court precisely what it argues to this Court now: that the term "vector" in the definition of "delta set" functions to permit a delta set to be represented via any "mathematical representation." Appx795-796. The District Court rejected that argument in a tentative ruling. Appx8244-8247; Appx8253-8254. McRo's counsel told the District Court that McRo had ***no objection*** to that ruling, and the District Court made it final. Appx229 at 39:6-14. This Court has found waiver on less, and should affirm the judgment of non-infringement on this basis alone.

The District Court's Construction. On the merits, the District Court was correct to require that a "delta set" be represented by vectors in three-dimensional space. The District Court correctly determined that the "plain and ordinary"

meaning McRo urges for the term "vector"—its broadest mathematical definition of "any ordered list of numbers"—is not the "plain and ordinary" meaning when reading the claims in light of the specification, as the law requires. The District Court instead concluded that the "plain and ordinary" meaning of the term "vector" in the context of the patent and the claim term "morph weight set[s]" was a quantity with direction and magnitude in three-dimensional space. Appx16-17; Appx21-22; Appx24. No credible intrinsic or extrinsic evidence supports McRo's preferred definition. Indeed, McRo's own expert did not use it in locating a "delta set" in the accused games.

Alternative Grounds for Affirmance. Even if McRo's preferred construction of "morph weight set" were correct, affirmance would still be warranted because the infringement theory in McRo's opening brief—just McRo's latest since this case began in 2012—fails on the merits. Undisputed evidence shows that even under McRo's construction, the "bone transformations" that McRo identifies as constituting the "delta set" do not satisfy the definition of the term.

Invalidity. The District Court correctly held that the crucial "first set of rules" limitation, which this Court has acknowledged constitutes the asserted claims' point of novelty over the prior art, is not enabled as a matter of law. Contrary to McRo's argument, the District Court did not reach that holding based on a finding that the specification fails to enable the prior art or the accused products. Instead, the District

Court found that the specification's narrow disclosure of one specific type of ruleset was insufficient to enable the full scope of the claims obtained by McRo in claim construction. Appx36-47. That conclusion is supported by testimony from Appellees' expert, and is not refuted by McRo's conclusory and legally deficient expert testimony.

Request for Reassignment. McRo has not articulated any bias or otherwise met the standard for reassignment.

ARGUMENT

I. THIS COURT SHOULD AFFIRM SUMMARY JUDGMENT OF NON-INFRINGEMENT.

A. McRo Acquiesced To The Construction Of "Morph Weight Set" And Waived Its Appeal.

As explained above, the claim construction position that McRo now advocates is one that was rejected by the District Court in a ruling that McRo acquiesced to. *Supra* at 8-11.

McRo proposed that a "delta set" is "the mathematical representation of the difference between the neutral model and another model," telling the District Court that it should adopt McRo's proposal because "mathematical representation" is a "simplification" that is "***consistent with the operation of the 'vector' in the definition of 'delta set.***'" Appx795. Appellees opposed McRo's proposal on the ground that substituting "mathematical representation" for "set of vectors from each vertex n on the reference to each vertex n on each morph target" was "not a 'simplification,' but rather an attempt to gloss over . . . precisely <u>what type</u> of 'mathematical representation' is encoded in the delta sets." Appx751 (emphasis original).

At the *Markman* hearing, the District Court's tentative ruling rejected McRo's argument, finding that McRo's "mathematical representation" language was "not an innocuous simplification, but rather, a significant generalization" of how a delta set was actually represented. Appx8246. McRo stipulated to the tentative ruling,

advising the District Court that it had "no objection to your Honor's tentative." Appx229 at 39:13-14; *supra* at 10-11. The District Court confirmed its tentative ruling on this issue. Appx902.

In this appeal, McRo seeks to reargue the ruling it agreed to five years ago: that any arbitrary "mathematical representation" of the difference between the neutral model and another model cannot constitute a "delta set." BB at 20-33. Indeed, in deciding summary judgment, the District Court noted that McRo's contention regarding the meaning of "vector" was an attempt to relitigate a dispute the District Court had already decided: "Although Plaintiff frames the dispute as one where the Court is impermissibly narrowing the meaning of 'vector,' ***Plaintiff is effectively urging the same impermissibly broad meaning of the term 'vector,'*** when considered in the context of the patent specification, that it argued during claim construction and that ***the Court rejected***." Appx17.

The District Court was correct. "Any ordered list of numbers representing the difference between the positions of the vertices on the neutral model and another model" is no different than a "mathematical representation" of that difference. It may even be broader: ***any*** data can be represented in a binary format via an "ordered list" of the numbers zero and one. And McRo told the District Court during claim construction that in its view, its "mathematical representation" proposal flowed

directly from the definition of the term "vector." Appx795-796. McRo then chose not to challenge the tentative ruling squarely rejecting its argument. *Supra* at 10-11.

This Court has found waiver in similar situations. In *Digital-Vending Services International, LLC v. University of Phoenix, Inc.*, 672 F.3d 1270, 1277-78 (Fed. Cir. 2012), the parties stipulated to a construction of the term "registered user," with the defendant making clear to the plaintiff before the *Markman* hearing that the import of the stipulated construction would be that "registered user" would inherently also require the presence of a registration server. *Id.* at 1278. When the defendant moved for summary judgment of non-infringement, the plaintiff tried to litigate whether a registration server was indeed required, and lost. *Id*. This Court found waiver based on the plaintiff's acquiescence at the *Markman* stage. *Id.* at 1277-78. Likewise, in *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 889 (Fed. Cir. 2004), this Court found waiver based on an appellant's comments at the *Markman* hearing that "I don't think there's any disagreement" on the issue being appealed. So too here. During claim construction, McRo made an argument substantively identical to the one it currently advances, the District Court rejected it in the tentative ruling, and McRo did not challenge or object to the result. This Court should find that McRo has waived this issue for appeal, which requires affirming summary judgment of non-infringement.

B. The District Court Properly Construed "Morph Weight Set."

Even if McRo had not waived its appeal on the only claim construction issue presented, affirmance would still be warranted. McRo disputes only whether the District Court correctly defined "delta set" as a mathematical structure represented by a set of vectors having magnitude and direction in three-dimensional space, rather than a set of "vectors" under the term's broadest generic mathematical definition of "any ordered list of numbers." For multiple independent reasons, the District Court assigned "vector" the correct plain and ordinary meaning.

1. The District Court Assigned "Vector" The Correct Plain And Ordinary Meaning In The Context Of The Specification.

McRo's only argument relates to the meaning of the word "vector" in the District Court's undisputed construction of "morph weight set." McRo argues that "vector" must take the meaning assigned to the term in certain mathematical and computer science contexts: "any ordered list of numbers." BB at 29-32. Therefore, according to McRo, the District Court was wrong to restrict its reading of the term "vector" in its construction of "delta set" to any other definition. McRo would have this Court hold that the requirements of a "delta set" can be met with ***any*** mathematical representation of the difference between a neutral model and the model of another mouth position that takes the form of an ordered list of numbers.

"The words of a claim are generally given their ordinary and customary meaning as understood by a [POSITA] ***when read in the context of the specification***

and prosecution history." *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012); *see also Trustees of Columbia University in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1363 (Fed. Cir. 2016) ("[t]he only meaning that matters in claim construction is the meaning in the context of the patent"). "The customary meaning of a claim term is not determined in a vacuum and should be harmonized . . . with the intrinsic record, as understood within the technological field of the invention." *Lexion Med., LLC v. Northgate Technologies, Inc.*, 641 F.3d 1352, 1356 (Fed. Cir. 2011). A general "ordinary meaning" of a term that is not its "ordinary meaning . . . when read in the specific context of the specification" is not the correct starting point for claim construction. *UltimatePointer, LLC v. Nintendo Co.*, 816 F.3d 816, 823-24 (Fed. Cir. 2016).

For example, it is improper to import a dictionary definition of a term that does not comport with the intrinsic evidence, even if it reflects the term's "ordinary meaning" in some sense. *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1326 (Fed. Cir. 2004); *accord Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (en banc) ("[I]f the district court starts with the broad dictionary definition . . . and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive."). Likewise, it is error to adopt an expert witness's definition of a term that is contrary

to the meaning of the term evident from the specification. *Vitrionics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

Here, the patentee's "express definition" of the term "delta set" on which McRo relies comes in the context of a description of a set of three-dimensional computer models that each have "the same topology as the neutral model" and "the same number of vertices," with "each vertex on each model logically correspond[ing] to a vertex on each other model, [f]or example, vertex #n on all models represents the left corner of the mouth, and although this is the typical case, such rigid correspondence may not be necessary." Appx61 at 1:54-59. Immediately thereafter, the specification states that "the deltas of each vertex on each morph target relative to the neutral are computed as a vector from each vertex n on the reference [model] to each vertex n on each morph target." Appx61 at 1:60-62. Thus, the specification defines a vertex as a point in three-dimensional space (*e.g.*, the left corner of the mouth on the facial model) and states that the delta set is computed as a vector from one such point to another.

The specification then describes the computations that are carried out using these vectors. Each delta set is assigned a morph weight ("usually from 0 to 1") and each vector in the delta set is scaled by the magnitude of the "scalar" morph weight (such that, *e.g.*, a vector of length 1 in a delta set assigned a morph weight of 0.5, will be scaled to become a vector of length 0.5). Appx61 at 1:65-2:20. The

corresponding vectors from each delta set are summed together and added to the position of the corresponding vertex on the neutral model to give the resultant position of the vertex. Appx61 at 2:5-9.

The District Court correctly recognized that in this context, McRo's proposed definition of "vector" as "any ordered list of numbers" is inappropriate, and that another customary meaning of "vector" ("a quantity having magnitude and direction in three-dimensional space") governs.[2] *Zircon Corp. v. Stanley Black & Decker, Inc.*, 452 F. App'x 966, 973-74 (Fed. Cir. 2011) (given competing plain and ordinary meanings, the one more pertinent to the patent should govern). The specification and the undisputed construction of "morph weight set" adopted by the District Court show that the vectors constituting each "delta set" are vectors "from each vertex on the neutral (reference) model to each vertex on a model of another mouth position." Appx902; Appx61 at 1:59-64. Each "vertex" is described as a point on the model—*i.e.*, in three-dimensional space. Appx61 at 1:54-56. While it may be true that "vector" can sometimes be used to signify any array of numbers, such a definition would render the definition of "delta set" meaningless: "any ordered list of numbers from one point in three-dimensional space to another" does not make sense.

[2] As Appellees pointed out, the first definition of "vector" in the Merriam-Webster dictionary is "a quantity that has magnitude and direction and that is commonly represented by a directed line segment whose length represents the magnitude and whose orientation in space represents the direction." Appx7303 at n.3.

Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, 1336 (Fed. Cir. 2001) (adopting narrower construction where broader meaning would import a logical contradiction into the claims and finds no support in the specification). Indeed, McRo's expert recognized that the District Court's undisputed construction required "a vector ***between each vertex on the Neutral and Delta models.***" Appx4659-4660.

The District Court correctly determined that "together, these aspects of the patent disclosure reveal the same thing: vertices exist on the models and the difference between two corresponding vertices (obtained through simple subtraction) represents the vector for those corresponding vertices in the delta set." Appx15-16.

2. McRo's Proposed Definition Of "Vector" Lacks Intrinsic Evidence Support.

McRo offers no direct intrinsic support for its expansive definition of "vector." Neither the specification nor the file history offers any hint that the inventor conceived of "delta sets" being represented by vectors in the abstract sense of "any ordered list of numbers." To the contrary, the context in which the term is used overwhelmingly supports the common spatial definition. McRo's attempts to mine the specification for oblique support for its position fall flat, and contradict its own position before the District Court.

First, McRo argues that the computations provided in the specification must only be exemplary because they assume a "rigid correspondence" between vertices on the neutral model and vertices on each morph target, and the specification says that "although this is the typical case, such rigid correspondence may not be necessary." BB at 26-27; Appx61 at 1:57-59. McRo contends that this opaque phrase means that the inventor must have envisioned countless, unenumerated ways to represent delta sets using "any ordered list of numbers," even though no such embodiments are mentioned, much less enabled. BB at 29-32.

McRo provides no evidence that this is how a POSITA would understand the term in the context of the patent. McRo disregards the far more natural reading—that vertices on a morph target that do not have a corresponding vertex on a neutral model would simply be excluded from the delta set and thus from the morph weight computation (and have their final location computed another way). Furthermore, given the District Court's clear definition of a "delta set" as something computed in the form of vectors ***between vertices on the neutral model and vertices on another model***, it is unclear how defining a vector as "any ordered list of numbers" would bring that construction more into line with the statement that in some cases a rigid correspondence may not be necessary—the construction still requires a correspondence between the neutral model and the morph target for at least those vertices whose deltas constitute the delta set. In short, whatever this phrase means,

it cannot override the clear import of the ***relevant*** portions of the specification and their usage of "vector." *Medtronic Navigation, Inc. v. BrainLab Medizinische Computersysteme GmbH*, 222 F. App'x 952, 956-57 (Fed. Cir. 2007) (stray reference to unenabled alternative embodiment does not justify broader construction of a claim term).

McRo's current position also conflicts with its own expert's testimony. In his expert report, Dr. Gleicher argued that vertex correspondence was ***necessitated by the District Court's undisputed construction*** (even before the District Court clarified that the vectors representing the delta set be vectors in 3-D space). Appx4659 ("Under the [District] Court's construction, a Delta Set also ***requires*** that each of the models has a corresponding set of vertices, otherwise there cannot be a vector between each vertex on the Neutral and Delta models."). This is directly contrary to McRo's current position that the correct construction of "morph weight set" (the same one under which Dr. Gleicher was operating) does not require delta sets to have a vector for each vertex on the neutral or reference model.

Second, McRo cites a supposed claim construction canon that the indefinite article "a" in a claim limitation can encompass plural and singular forms of the noun that follows. BB at 23–24. McRo omits the context of the rule, though both cases McRo cites provide it: "This court has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in ***open-***

ended claims containing the transitional phrase comprising." *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000); *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342-43 (Fed. Cir. 2008) (same).

Here, the phrase "a vector" does not come in the context of an open-ended list of requirements in a "comprising" claim. It comes, instead, in a definition of a mathematical concept in the art. And even apart from the fact that McRo's cited canon of construction does not apply here, the context of the District Court's undisputed construction of "morph weight set," and the specification, make clear that what is required is a vector ***from*** one point in three-dimensional space ***to*** another point in three-dimensional space. *Supra* at 8-11. McRo's proposed definition of "vector" should be rejected as lacking intrinsic evidence support.

3. Neither Side's Expert Testimony Changes The Analysis.

McRo argues that both experts agree that the definition of vector is "any ordered list of numbers." BB at 29-31. It would be more accurate to say that both experts agree that this is ***a*** definition of "vector." And ***neither*** expert applied this definition in the context of "delta set." Appellees' expert distinguished the type of vectors constituting a delta set from the sorts of bone transforms McRo claims meet the definition. Appx6765 at 241:7-16. And McRo's expert recited "any ordered list of numbers" as a definition of "vector" in the abstract, Appx4651-4652, but did not use it when applying the construction of "morph weight set" to the accused products.

Appx4659-4660. Neither expert's testimony suggests the District Court erred in construing the claims. Instead, they affirm the District Court's understanding of how a POSITA would read the claims and specification.

McRo asserts that Appellees' expert, Dr. Dobkin, testified that the '278 Patent does not limit the definition of "vector" beyond how vectors are computed, or specify how vectors have to be stored. BB at 24-25. But in the cited testimony, Dr. Dobkin merely agrees that the specification says what it says—that "vectors are computed" and that the part of the specification to which he was pointed does not specify how vectors must be stored. Appx6732 at 107:17-109:6. In the portions of his testimony that McRo omits, Dr. Dobkin confirms the District Court's understanding of what "vector" means ***in the context of a delta set***:

> **Q.** [Y]ou said . . . that the claim construction does not explicitly require three components. How do you believe the claim construction is quite clear to your interpretation?
>
> **A.** So a vector from each vertex on the neutral (reference) model to each vertex on a model of another mouth position. So you are taking a point in three space, which is the vertex on the neutral (reference) model, and another point in three-space, which is the vertices of a vector on the model of another face position; and you are going from here to there in some way. To me, mathematically, if you have got an object in three dimensions and you have got another object in three dimensions, the way you get from here to there is with a vector in three dimensions.

Appx6733 at 112:20-113:21. Similarly, while Dr. Dobkin testified that bone transforms are "10-vectors," he also expressly affirmed his understanding that delta

sets are "3-vectors," consistent with the District Court's reading. Appx6765 at 241:7-16. Dr. Dobkin's testimony is consistent with Appellees' position in this appeal: in the context of the patent's definition of "delta set," it does not make sense to give "vector" its broadest mathematical meaning.

Dr. Gleicher's report is in accord. Its "Technology Background" section recites McRo's current position that "vector" can mean "an ordered list of real numbers," but Dr. Gleicher ***never applies this definition to identify a delta set in the accused games***, or returns to it again in his report. Appx4651-4652. Instead, in analyzing the accused games, he states: "Under the [District] Court's construction, a Delta Set . . . requires that each of the models has a corresponding set of vertices, otherwise there cannot be a vector between each vertex on the Neutral and Delta models. . . . [T]he construction places no other limitations on what the Delta Set is. The ***requirement for a vector between each corresponding pair of vertices*** is always met because ***every pair of vertices defines a vector (via subtraction)***." Appx4659-4660. Thus, while Dr. Gleicher duly recited McRo's definition of "vector" in the abstract, he agreed that the hallmark of a "delta set" ***under McRo's preferred construction*** was whether it was possible to identify a vector in three-dimensional space (*i.e.*, defined by subtraction of one point's coordinates in a three-dimensional reference frame from another's).

4. There Is No Dispute That Appellees Were Entitled To Summary Judgment Of Non-Infringement Under The District Court's Construction.

McRo does not challenge the District Court's grant of summary judgment of non-infringement on any basis other than the claim construction of "morph weight set." BB at 19-33. Because the District Court correctly construed the term, and because there is no dispute that Appellees are entitled to summary judgment under the District Court's construction, this Court should affirm.

C. Summary Judgment Was Proper Even Under McRo's Construction.

Even if this Court were to determine that the District Court's claim construction was erroneous, it should still affirm the District Court's grant of summary judgment of non-infringement. Even under McRo's preferred construction, and even if its current infringement theory were supported in the record, the bone transforms McRo identifies as "delta sets" still would not satisfy the undisputed claim requirement that the delta set vectors be "from each vertex on the neutral model to the corresponding vertex on another mouth position."

As discussed *supra* at 13-19, McRo's expert report did not contain the infringement theory McRo advances now. Dr. Gleicher advanced the theory that "delta sets" were inherent in the fact that the artists who created the facial models for use in the accused games created morph targets by deforming a neutral model. Appx4682-4683. The reason for this, according to Dr. Gleicher, was that vertex

correspondence between a neutral model and a morph target (what Dr. Gleicher called a "delta model") was a sufficient condition to have a "delta set." [3] Appx4659-4660. Indeed, while the "Technology Background" section of Dr. Gleicher's report briefly set forth the view that bone transforms are "vectors" as that term is used in computer science and mathematics,[4] Dr. Gleicher never read the claims onto bone poses in the accused games or otherwise opined that bone transform values in the accused games constitute delta sets. In short, after litigating this case for seven years, McRo failed to present admissible evidence to support the infringement theory it is advancing in its second appeal.

But even if it had, its infringement theory would still fail. McRo seeks to overturn the District Court's grant of summary judgment of non-infringement on the basis that the "transform vectors" that encode the bones controlling the vertices on the facial model constitute "vectors" meeting the District Court's definition of "delta set." BB at 14. McRo argues that while the transformations encoding the bones are not vectors in three-dimensional space, they are simply "a more concise way to

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[3] As discussed *supra* at 16-17, this is the polar opposite of McRo's current position that a "delta set" does not require vertex correspondence.

[4] In his deposition, Dr. Gleicher repeated his view that bone transforms constitute vectors, but did not testify that they constituted delta sets, and indeed admitted that additional "vectors" would be required to describe the movement of a vertex. Appx4997 at 179:6-13, 179:23-180:11; Appx4998 at 183:20-184:8; Appx5033 at 321:17-322:7.

utilize a set of vectors to define the movement of the vertices in the facial model." *Id.* However, no matter how broadly "vector" is defined, bone transforms generated by the accused systems cannot constitute vectors "from each vertex on the neutral model to the corresponding vertex on another mouth position" because they do not themselves describe the movement of ***any*** vertex on the neutral model.

Bones are abstract mathematical objects that are overlaid on top of the facial model to provide the animator an easy means of controlling the face without having to manipulate individual vertices. Appx5952-5954; Appx4648-4651. Bone transformations (McRo's supposed "vectors") describe how the bones move, not how the vertices move. Appx4988 at 142:13-143:11; Appx5953-5954; Appx6071. For that, one would need additional information—most notably an accounting of how the vertices are attached to each bone and how the movement of each bone affects the movement of the vertices—that the bone transformations do not contain. Appx4988 at 142:13-143:11; Appx5953-5954; Appx6071.

Here, each bone transformation in question defines one bone. And it is undisputed that each bone controls multiple vertices, and multiple bones may control the same vertex, with the vertices controlled by one bone overlapping with the vertices controlled by other bones. Appx23; Appx4649-4651; Appx5952-5954; Appx4988 at 142:13-143:11 (Dr. Gleicher confirming: "So to figure out what happens to a particular vertex, one needs additional information besides just

what the bone transform is."). So bone transformations cannot define the movement of individual vertices. Moreover, McRo has admitted that "the bone transform values alone do not indicate how a vertex moves to get from its position on the reference model to its position on the model of another mouth position (a morph target)." Appx6071.

This is dispositive. Leaving aside what "vector" means, if the District Court's construction (to which McRo acquiesced and now disputes on appeal) is to mean anything at all, it must mean that ***whatever*** "vector" is accused of constituting the delta set defines the movement of the vertex from its position on the neutral model to its position on a morph target. It is undisputed that the bone transforms McRo claims constitute the delta sets do not and cannot do this. Because ***each*** bone transformation (*i.e.*, each of McRo's supposed "vectors") may affect multiple vertices and multiple vertices may be affected by each bone transformation, a single bone transformation is not itself a vector from any vertex's position on the neutral model to its position on another model. Moreover, even all of the bone transformations taken together do not contain sufficient information to define the movement of any of the vertices from their position on the neutral model to their position on another model, because to do so would require additional information (the mapping and weighting of the vertices to the bones) that the transformations do not contain. Appx4988 at 142:13-143:11; Appx5953-5955; Appx6071.

Summary judgment of non-infringement should be affirmed for this additional reason.

II. THE DISTRICT COURT PROPERLY GRANTED SUMMARY JUDGMENT OF INVALIDITY.

This Court should affirm the District Court's finding that the '278 Patent is not enabled. The '278 Patent claims a "first set of rules that defines a morph weight set stream as a function of phoneme sequence and times associated with said phoneme sequence." Appx66 at 11:46-48. As this Court previously observed, and as the District Court acknowledged in its subsequent summary judgment ruling, the "first set of rules" constitutes the claimed invention's contribution to the art, the rules being the method of automation of a prior art process. Appx45; *McRO*, 837 F.3d at 1313.

Appellees moved for summary judgment of non-enablement because the specification failed to enable the full scope of the crucial "first set of rules" limitation as construed by the District Court at McRo's urging. Appx7539-7563. The District Court agreed, finding that while "the [specification's] exemplary rules all relate to a narrow subset of rules that are relevant to an 'if . . . then . . . else' keyframing approach," the claims cover more. Appx37-38; Appx45-46. The District Court also credited the testimony of Appellees' expert, Dr. Wyvill, that the specification's exemplary rulesets did not enable a POSITA to construct a working system without undue experimentation. Appx42-43; Appx46-51.

McRo largely ignores the grounds for Appellees' motion and the District Court's ruling, which was based on an application of this Court's holdings that (1) broad genus claims lacking specification disclosure to teach a POSITA how to make and use the invention across the full scope of the claims are invalid, and (2) when the claim limitation in question is the claims' supposed point of novelty, a patentee may not simply refer to the knowledge of a POSITA for enabling disclosure. Appx36-47. Applying that precedent, the District Court found that the testimony of McRo's expert—who insisted, contrary to law, that providing one narrow example of a "first set of rules" was enough and that a POSITA could then "transfer known rules from other systems"—was insufficient to raise a genuine issue of material fact. Appx44-45. This Court should affirm.

A. The Patent Claims A Broad Genus Of "First Set Of Rules" But Does Not Enable Its Full Scope.

Section 112's enablement requirement ensures "adequate disclosure of the claimed invention" while "preventing claims broader than the disclosed invention." *MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1380-81 (Fed. Cir. 2012). If a patent enables some embodiments within a claim's scope but not others, then the claim is invalid. *See, e.g.*, *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999-1001 (Fed. Cir. 2008) (claims encompassing both video games and movies were invalid where specification taught use of invention only in video games); *Auto. Techs. Int'l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1281-85 (Fed. Cir. 2007)

(claims encompassing mechanical and electronic side-impact sensors were invalid where specification enabled only mechanical sensors).

1. McRo Pushed To Construe The "First Set Of Rules" Broadly Despite The Specification's Extremely Narrow Disclosure.

As this Court recognized in the earlier appeal, the patent claims a genus in the form of a "first set of rules." *McRO*, 837 F.3d at 1313. Before summary judgment, Appellees twice asked the District Court to construe the limitation to narrow the scope of that genus in light of the specification and McRo's earlier statements to this Court. Appellees argued that because the specification discloses ***only*** a keyframing implementation using "if . . . then . . . else" correspondence rules to define morph weight sets at specific times (keyframes), and similar transition rules to define the parameters of interpolation between those keyframes, the term "first set of rules" should be limited to those types of correspondence and transition rules.[5] Appx965-969. McRo opposed any such restriction. Appx1654-1659. At McRo's urging, the District Court found that no limiting construction was warranted. Appx2787-2790. McRo thereby ensured that the term remained unbounded in scope, covering ***any*** "set of instructions." *See, e.g.*, Appx706.

[5] McRo also described this as the operation of the claimed invention in its earlier briefing to this Court. Appx1380-1385; Appx969-971; Appx2002-2003.

The specification discloses only two narrow species of such rules, working together to enable one type of rule-based system that generates morph weight sets at certain significant times (keyframes) in the animation, and then interpolates between them. *E.g.*, Appx62-64 at 4:1-11, 4:52-57, 5:5-12, 5:25-28, 5:45-65, 6:33-43, 6:44-65, 7:55-8:40; Appx66 at 11:22-28; Appx2887-2889. Moreover, every exemplary rule in the specification is structured as an "if . . . then . . . else" logic statement, though McRo's expert opined that the invention was not limited to such rules. *Id.*; Appx4942. Further, as the District Court correctly held (and this Court had earlier recognized), "[t]here can be no dispute that the novel aspect of the '278 patent's asserted claims relates to the 'first set of rules' limitation." Appx45; *McRO*, 837 F.3d at 1313.

2. The District Court Properly Credited Appellees' Expert's Testimony That The '278 Patent Does Not Enable The Full Scope Of The "First Set Of Rules."

"[T]o be enabling, the specification of a patent must teach [a POSITA] how to make and use the full scope of the claimed invention without undue experimentation." *Trs. of Boston Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018). Arguing for and obtaining a virtually boundless construction of a claim term that provides the claim's contribution to the prior art has consequences. "[A] patentee chooses broad claim language at the peril of losing any claim that cannot be enabled across the full scope of coverage." *MagSil*, 687 F.3d at 1381.

While a patentee is not required to disclose every species encompassed by a claim, "there must be sufficient disclosure, either through illustrative examples or terminology, to teach [a POSITA] how to make and how to use the invention as broadly as it is claimed." *In re Vaeck*, 947 F.2d 488, 496 (Fed. Cir. 1991).

Appellees' expert provided testimony that "the '278 Patent's specification fails to provide a [POSITA] with the tools needed to develop, without undue experimentation, rules having the breadth and complexity of the claimed genus of 'first set of rules.'" Appx5893-5894. The specification's disclosure of only a few examples of basic correspondence and transition rules, and statements that the user would have to manually set up the remainder, do not "remotely disclose ways to develop the sorts of rules that would actually work to generate realistic facial animation," and any rules capable of achieving that purpose "would have to be far more complex than the examples given." Appx5895. Appellees' expert explained that (1) "the only specific examples of particular rules disclosed are a handful of simplistic 'criteria-function'-type rules that merely directly associate phonemes or phoneme sequences with delta sets or transition parameters (or perform similarly crude 'if . . . then' operations)," and (2) the only "structural (or algorithmic) features common to all members of the genus" identified are "much narrower and more

specific than the scope of the claims as written" and interpreted by McRo.[6] Appx5890-5891.

The District Court rightly credited this testimony over the legally- and factually-unsupported testimony of McRo's expert, Dr. Gleicher, that the specification was enabling because it (1) provided "examples of how common rule types [sic] and how they can be embellished with artistic effects," and (2) "instruct[ed] [a POSITA] on how to transfer known rules from other systems." Appx4944-4945. Dr. Gleicher's opinion fails for several reasons.

First, with respect to "examples of []common rule types," the only examples provided are correspondence and transition rules for a keyframing system. Appx62 at 4:47-60; Appx63 at 5:45-6:2; Appx64 at 7:8-15; Appx64-66 at 7:50-11:11. The patent nowhere instructs how to extrapolate from that rule type to other rule types, and Dr. Gleicher could not and did not argue otherwise. Providing examples of one narrow species of rule does not relieve the patentee of the obligation to enable the

[6] McRo's complaint that the District Court relied on sections of Dr. Wyvill's report pertaining to written description is irrelevant. BB at 35. Dr. Wyvill expressly cross-referenced and relied upon the written description section in the enablement section of his report, Appx5891, and the District Court correctly relied on Dr. Wyvill's opinions concerning the specification's failure to demonstrate possession across the full scope of the genus as additional support for his statement that the specification also "fails to provide a [POSITA] with the tools needed to develop, without undue experimentation, rules having the breadth and complexity of the claimed genus." Appx5893-5894.

remainder of the genus, when the entire genus is claimed. And as Dr. Wyvill testified, the narrow disclosure provided is insufficient to enable a POSITA to make use of the claims in a working system. *E.g.*, Appx3173 at 229:5-11; Appx3175 at 237:18-23; Appx3176 at 238:11-239:4; *see also* Appx5893-5894.

Second, with respect to "transfer[ring] known rules from other systems," McRo cannot rely on the prior art to enable the supposed improvement of the patented invention over the prior art. Because the use of the claimed rules to automate morph weight set animation is the patent's claimed contribution to the art, the ***specification*** must contain the enabling disclosure for the claimed rules. *See, e.g.*, *Auto. Techs. Int'l, Inc.*, 501 F.3d at 1283 ("the novel aspect of an invention must be enabled in the patent").

Moreover, contrary to Dr. Gleicher's conclusory statement, the specification provides no instructions for how to "transfer" complex rule sets from prior art systems, "particularly rule sets that do not rely on 'if . . . then . . . else'" keyframing. Appx45. The District Court was correct not to credit Dr. Gleicher's conclusory testimony that a POSITA would have simply known how to do this. *Id*.; *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001) ("Broad conclusory statements offered by" experts are "not sufficient to establish a genuine issue of material fact."). That is particularly true in light of Dr. Gleicher's contradictory opinions on prior art invalidity, which criticized ***the very prior art*** that

he claimed would provide the missing rulesets as being fundamentally incompatible with the claimed invention. Appx4899-4900 (criticizing Pelachaud prior art as requiring "the rule author to think in terms of the complexities of human anatomy" such that "defining new rules, or tweaking existing ones, requires a great deal of specialized knowledge" and "may not apply to [non-human] characters . . . ."). The District Court correctly found that Dr. Gleicher's testimony was insufficient to raise a genuine issue of material fact. Appx45.

B. The District Court Did Not Base Its Ruling On A Failure To Enable The Prior Art Or The Accused Products.

At the summary judgment hearing, McRo demanded examples of rulesets that were not enabled, arguing that "in every case [finding non-enablement in this scenario], there is a specific example of something covered by the claims that an expert opines would require excess experimentation. Defendants and their expert provide no such example." Appx498 at 34:11–20. ***In response***, the District Court identified two types of rulesets that would fall within the scope of the "first set of rules" limitation: one pertaining to the BALDI prior art system and another pertaining to bones animation, which McRo had asserted (and asserts in this appeal) infringed. Appx41-43.

McRo now argues that it is improper to base a non-enablement ruling on a failure to enable the prior art or the accused products. But that is not what the District Court did. Instead, at McRo's insistence, the District Court "identified some

examples of constructs that [Appellees' expert] believes would be ***covered by Plaintiff's interpretation of the claims***, but would require excess experimentation when considering the scope of the patent disclosure." Appx42. The District Court then quoted Appellees' expert's analysis of rulesets from the prior art BALDI system[7] and the accused bones animation technology as examples of rules for which the '278 Patent's specification provides no guidance. Appx42-43. The District Court agreed with McRo that "[i]t is the asserted claims rather than the accused device which must be 'enabled' by the patent-in-suit," but noted that "the accused products are still a relevant example of a modern system Plaintiff previously argued as covered by the 'first set of rules' limitation of the claims."[8] Appx42.

The District Court ultimately concluded that the specification did not enable the full scope of the "first set of rules" not because it failed to enable BALDI or bones animation, but because (1) it disclosed only a "few narrow species within the

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[7] McRo cites testimony from Dr. Wyvill that it would have been trivial for a POSITA to modify the BALDI system to generate morph weight sets, as evidence that "a reasonable jury would not be required to find that a claimed implementation of BALDI's rule set would require excess experimentation." BB at 36-37. This misses the point: BALDI, unlike the '278 Patent, ***provided a working set of rules***. Appx5838-5839. That it would have been trivial to modify ***the use of those rules*** to generate an output in the correct format does not imply that it would have been trivial to ***generate the rules*** based on the bare disclosure in the '278 Patent's specification.

[8] The District Court also noted that bones animation did not infringe the '278 Patent because it does not satisfy the "morph weight sets" (rather than the "first set of rules") limitation. Appx42 at n.11.

claimed rule genus"; (2) McRo's argument that the required rules could be "transferred" from the prior art failed as a matter of law; and (3) under the *Wands* factors, the narrow species of rules disclosed failed to enable a POSITA to "actually construct a working system" across the full scope of the claims. Appx36-52.

C. The *Wands* Factors Show That Practicing The Full Scope Of The Claimed Invention Would Require Undue Experimentation.

The District Court properly found that the eight *Wands* factors "further confirm" that there is no genuine factual dispute that the "first set of rules" limitation is not enabled. Appx47.

1. Factor 1: Quantity Of Experimentation Necessary

The District Court properly found that the first factor favors non-enablement. Appx47-49. Appellees' expert Dr. Wyvill opined that in light of the '278 Patent's disclosure being "limited to a handful of crude, simplistic 'if . . . then' statements," creating a working set of rules with the breadth and complexity of the claim scope McRo asserted would require "years of development and experimentation—far more than could ever be considered routine." Appx5888; Appx5893-95. When combined with the '278 Patent's express statement that the design of ***even one working set*** of rules is an exercise for the reader, the District Court concluded that the "quantity of experimentation" *Wands* factor favored a finding of non-enablement. Appx47-49. McRo raises three arguments in response. Each one fails.

First, McRo argues that the District Court wrongly relied on Dr. Wyvill's opinion that the '278 Patent did not enable generating "high-quality" or "realistic" animation because the claims do not require "high-quality" or "realistic" animation. BB at 45-48. But Dr. Wyvill's core enablement opinion was not premised on the animation being high quality. Rather, Dr. Wyvill opined that "the '278 Patent's specification fails to provide a [POSITA] with the tools needed to develop, without undue experimentation, rules having the breadth and complexity of the claimed genus for 'first set of rules.'" Appx5893-5894. And he opined that specification "does not provide a set of rules sufficient to actually construct a working system" ***at all***. Appx5889.

Moreover, McRo misreads *CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333 (Fed. Cir. 2003). BB at 46-47. While *CFMT* held that "enablement does not require an inventor to meet lofty standards for success in the commercial marketplace," it also held that Section 112 requires enablement of a system that ***works*** to achieve its stated goal. 349 F.3d at 1338, 1339. The issue in *CFMT* was what level of cleaning was required to satisfy a claim limitation. *Id.* Because the claim did not recite any level, any amount of cleaning would satisfy the claim language, and a specification that enabled any level of cleaning would enable the invention as claimed. *Id.* Here, the claims do not require merely "any level" of lip synchronization—they require "automatically animating lip synchronization and facial expression of three-

dimensional characters," to achieve the invention's "primary object" of "producing ***accurate and realistic*** lip synchronization and facial expressions in animated characters." Appx61 at 2:43-48. And Dr. Wyvill, a recognized expert in the field who developed pioneering automatic lip-synchronization systems, provided competent testimony that the specification does not enable a POSITA to build a working system, and that formulating rules that would generate realistic or high-quality animation (per the specification's stated goal) would take an enormous amount of time. Appx5751-5752; Appx5889; Appx5893-5896.

Second, McRo argues that the District Court wrongly relied on Dr. Wyvill's opinion that the specification did not enable the development of a ruleset for "all visual phoneme groups" because the claims only require the system to be able to handle the phoneme groups in the claimed time-aligned transcript. BB at 48-49. But the issue is not whether the specification enables a POSITA to develop a ruleset for a system that works for some phoneme groups (a small number of embodiments to say the least). It is whether the specification enables the ***full scope*** of the claims—a ruleset that works for all phoneme groups. This requirement comes from the patent itself: the specification states that "[i]n operation and use, ***the user must manually set up default correspondence rules between all visual phoneme groups*** and morph weight sets." Appx5890. And the inventor, Mr. Rosenfeld, testified that even a "minimal set" of rules required to operate the claimed invention needed to allow

"any word in the English language to be animated."[9] Appx7781-7782 at 109:1-110:5.

Third, McRo provides a string cite to excerpts of Dr. Gleicher's report for the proposition that "Planet Blue's expert disagreed with Appellees' expert concerning 'undue experimentation' and offered detailed opinions concerning the same." BB at 49. Not so. McRo cites primarily to paragraph 204 of Dr. Gleicher's report, which merely offered the legally insufficient opinion, as discussed above, that the "first set of rules" are enabled because a POSITA could have transferred "known rules from other systems." *Supra* at 47-48. The remainder of the cited testimony repeated that the rules in the specification were "exemplary" and that the patent intentionally left the development of specific rules to the user. Appx4945-4946. That is undisputed. The question is whether the specification provided enough guidance to the practitioner to develop a working "first set of rules" as broadly as they are claimed. On that question, Dr. Gleicher did not provide any relevant, non-conclusory testimony raising an issue of fact.

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[9] As for Mr. Rosenfeld's supposed testimony that developing such a "minimal set" of rules would "not take very long," BB at 49, Mr. Rosenfeld's actual testimony, in response to being asked how long it would take to develop a ruleset to animate any word in the English language, was: "[Y]ou could have a minimal set . . . . How long would that take? I don't know, but not very long." Appx7781 at 108:7-109:21. The District Court would have been justified in concluding that this testimony did not raise a genuine issue of fact in the face of Dr. Wyvill's expert testimony.

2. Factors 2 And 3: Guidance Presented And Working Examples

The District Court properly found that the second and third factors favor non-enablement. Appx49-50. Here, McRo argues again that the specification's disclosure of a few crude example rules enables the full scope of the claims because a POSITA would be able to employ prior art rules concerning coarticulation effects without undue experimentation. BB at 51. That argument fails, as discussed above. *Supra* at 46-48.

McRo also argues that the '278 Patent contains enabling disclosure in the form of ***the claims'*** "structural scheme": that the rules "define morph weight set streams as a function of phoneme sequence and timing and they must be applicable to sub-sequences of phonemes." BB at 51. McRo's expert offered no supporting testimony on this point. The paragraphs of Dr. Gleicher's report that McRo cites identified neither the common "structural features" of the rules supposedly evident from the specification, nor the "rule schema" that supposedly provides guidance on implementing the claimed invention. Appx4943-4945. They did not explain ***how*** the supposed (but unnamed) "rule schema" or common "structural features" would have guided the practitioner in selecting, formulating, and implementing rules of the breadth and complexity claimed and required to build a lip synchronization system. *Id.* Nor did they explain how the claimed inputs and outputs of the rules could possibly provide that guidance. *Id.* As Appellees' expert, Dr. Wyvill, specified, it

is getting from the inputs to the outputs that would have presented a challenge to the practitioner. *See* Appx3176 at 238:11-239:4.

Finally, McRo argues that the specification's failure to disclose exemplary rules other than ones in an "if . . . then . . . else" format is irrelevant. BB at 52-53. Not so: as Dr. Wyvill testified, the specification's disclosure of a few crude examples of rules in that format alone (out of the many rule formats a programmer might choose) are insufficient to enable a practitioner to build a system that works for the claims' intended purpose, and doing so would have required rules far more complex than the examples given. Appx5889; Appx5893-5895. The District Court thus properly concluded that the specification's failure to provide guidance on how to create (or transfer) and implement other rule types meant that these factors favor non-enablement.

3. Factors 4 And 7: Nature Of The Invention And The Unpredictability Of The Art

The District Court properly found that the fourth factor is irrelevant to the key enablement issue, *i.e.*, whether the specification enables the full scope of the novel aspect of the claimed invention—the first set of rules. Appx50. The District Court also properly found that the seventh factor favored non-enablement. Appx50-51. On both factors, Dr. Wyvill opined that "the results of experimenting with new sets of rules would have been difficult to predict, particularly for more complicated sets of rules," and that to get the claimed invention to achieve its stated goal would

require rules "far more complex than the examples given," highlighting the clear disconnect between the nature of the invention and the scarcity of the disclosure. Appx5889.

Whether computer animation was a well-developed field and a predictable area at the time of invention, and whether hand animation was time-consuming, BB at 39-40, 53, is irrelevant. As Dr. Wyvill opined, the development of new rulesets beyond those disclosed in the specification would have been unpredictable, even if the field of computer animation in general was predictable.[10] Appx5889. And McRo's expert Dr. Gleicher's testimony on this point was conclusory and ignored the central issue of whether development of new rules would have been unpredictable. Instead, he simply opined that (1) the rules are "computer rules that would operate precisely as they are intended"; and (2) the patent provides a "common structural characteristic" of the claimed rules in the form of their claimed inputs and outputs. Appx4943. The first is a tautology applicable to any computer science problem (computer code always operates as it is programmed), while the

[10] McRo cites testimony from Dr. Wyvill that the claimed invention used known methods to achieve predictable results, suggesting that this contradicts his testimony that the development of new rulesets would have been unpredictable. BB at 54-55. There is no contradiction: Dr. Wyvill opined that the ***idea*** of using rules as described in the claim was merely using known methods to yield predictable results; it was the formulation and implementation of the rules that would have presented the challenge to a skilled practitioner, and that is precisely what the '278 Patent fails to teach. Appx5893-5894; Appx3176 at 238:11-239:4.

second ignores the challenge in implementing the claimed invention (which is formulating the ***content*** of the rules).

McRo's remaining arguments on these factors are again that a POSITA would have been able to transfer known rules from prior art systems. BB at 54-55. That argument is contrary to law and to Dr. Gleicher's testimony. *Supra* at 47-48.

4. Factors 5 And 6: State Of The Prior Art And Relative Skill Of One In The Art

The District Court properly found that the fifth and sixth factors are irrelevant to the key enablement issue. Appx50. McRo's argument mostly rehashes its theory that the "first set of rules" limitation is enabled by the prior art. BB at 40-43. If anything, McRo's specific examples further illustrate why there is no factual dispute.

McRo writes that "[r]ules regarding coarticulation as a linguistic matter were known," and that "coarticulation rules disclosed in the literature could be modified based on the rule scheme taught in the '278 patent." BB at 40-41. It is unclear why McRo focuses on linguistic coarticulation rules, as if knowing "the manner in which certain phonemes affect surrounding phonemes" were enough to ***implement coarticulation in the form of rules in a computer program***, let alone formulate the "far more complex" rules needed to achieve the patent's stated purpose. Appx5895. Regardless, the ***only*** record evidence of coarticulation rules known in the art cited by McRo's expert Dr. Gleicher are in the same prior art whose rules he criticized as being fundamentally incompatible with the claimed method, or requiring an entirely

different approach to formulating rules. Appx4899-4900; Appx4923-4924; Appx4945; *supra* at 47-48. Furthermore, Dr. Gleicher's assertion that the '278 Patent "instructs [a POSITA] in how to transfer this knowledge [of coarticulation rules] into a production compatible system" is just wrong. Appx4945. Dr. Gleicher cited no support for this assertion, and one would search the specification in vain for ***any*** disclosure that can even arguably be read as instructing a POSITA how to transfer linguistic coarticulation rules from prior art systems and implement them according to the claimed method.

McRo also tries to distinguish *Automotive Technologies International, Inc. v. BMW of North America, Inc.*, 501 F.3d 1274 (Fed. Cir. 2007), and *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361 (Fed. Cir. 1997). BB at 43-44. McRo asserts that in *Automotive Technologies* there was "no dispute that 'electronic sensors,' the novel aspect of the invention, were ***unknown in the art***." BB at 44. But in *Automotive Technologies*, the patentee argued that a POSITA's "knowledge . . . was sufficient to supply the missing information": how to make and use an electronic sensor as part of the challenged claims. 501 F.3d at 1283. This Court rejected the argument precisely because the claimed sensor (like the first set of rules here) was "the essential concept of the invention" and it was thus "insufficient to merely state that known technologies can be used to create" it. *Id*.

Genentech is also on point. As here, the question was whether the specification enabled a POSITA to practice a particular step of the claimed method without undue experimentation. 108 F.3d at 1363, 1365. The specification did not "describe in any detail whatsoever" how to practice this step. *Id*. at 1365. The patentee argued that a POSITA's "knowledge . . . was sufficient to provide all of the missing information." *Id.* This Court disagreed, writing that "[p]atent protection is granted in return for an enabling disclosure of an invention, ***not for vague intimations of general ideas that may or may not be workable***. . . . Tossing out the mere germ of an idea does not constitute enabling disclosure. . . . [R]easonable detail must be provided in order to enable members of the public to understand and carry out the invention." *Id.* at 1366.

So too here. The record, including competent expert testimony, supported the District Court's conclusion that the '278 Patent's disclosure of the concept of using rules to automatically generate lip-synchronized animation for any English phoneme, along with a small set of crude exemplary rules, was a mere "starting point," a germ of an idea lacking true enabling disclosure.

5. Factor 8: Breadth Of The Claims

The District Court properly found that the eighth factor favors non-enablement. Appx51. Appellees tried twice to limit the breadth of "first set of rules" to align with the specification's disclosure. *Supra* at 11, 13. McRo prevailed on its

argument that "a set of rules is, quite simply, a set of instructions." Appx706; *supra* at 11, 13. That encompasses all computer software and more. The relevant claim limitation is thus maximally broad, and the District Court was justified in finding that this element favors a finding of non-enablement.

On this point, McRo cites this Court's comments from the prior appeal that "the claims themselves set out meaningful requirements for the first set of rules," identifying other claim limitations setting forth the rules' inputs and outputs. BB at 55-56. McRo again ignores the real enablement challenge: formulating the actual content of the rules that generate the output morph weight sets from the input time-aligned phonetic transcripts. On that question, McRo must bear the consequence of seeking to cover any "set of instructions" that achieves that goal. *See McRO*, 837 F.3d at 1313-14 (recognizing that Section 112 requires a patentee to justify broad claim scope with broad disclosure (citing *Carnegie Mellon Univ. v. Hoffman-La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008))).

III. REASSIGNMENT IS UNWARRANTED.

No evidence substantiates McRo's suggestions of bias. It was not improper for Judge Wu to interpret the claim language in light of the dispute that the parties presented regarding claim scope, or to take independent notice of a potentially dispositive issue in the record and request briefing. McRo cannot come close to meeting the standard for its reassignment request. *Liteky v. U.S.*, 510 U.S. 540, 555

(1994) ("[O]pinions formed by the judge on the basis of facts introduced or events occurring in the course of the current proceedings, or of prior proceedings, do not constitute a basis for a bias or partiality motion . . . .").

CONCLUSION

This Court should affirm the District Court's grant of summary judgment of non-infringement and invalidity.

Dated: August 23, 2019

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I hereby certify that, on this 23rd day of August, 2019, I caused to be electronically filed the foregoing with the Clerk of the Court using the CM/ECF system, and served, via email, a true and correct copy of the same to the following:

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