IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

IP INNOVATION, LLC and TECHNOLOGY LICENSING CORPORATION	§	
Plaintiffs	§	**CASE NO. 2:07 CV 503**
	§	**PATENT CASE**
vs.	§	
GOOGLE, INC.	§	
Defendant	§	

MEMORANDUM OPINION

This Memorandum Opinion construes the Patents-in-Suit: U.S. Patent Nos. 5,675,819 (the "'819 Patent") and 5,276,785 (the "'785 Patent").

BACKGROUND

Plaintiffs IP Innovation, LLC and Technology Licensing Corporation ("IPI") allege that Defendant Google, Inc. ("Google") has infringed the Patents-in-Suit. IPI acquired the Patents-in-Suit by way of assignment.

The '819 Patent, entitled "Document Information Retrieval Using Global World Co-Occurrence Pattens," describes two aspects of a document retrieval system. The first aspect of the '819 Patent is a method for constructing a statistical thesaurus based on the lexical co-occurrence of words in a particular group of documents (i.e., corpus of documents). Lexical co-occurrence exists if two terms appear in a body of text within some distance of one another. The lexical co-occurrence that exists for each word is represented by a vector. The word vectors are stored in a data

structure (i.e., thesaurus). The second aspect of the '819 Patent is directed to the retrieval of documents relevant to a search query. The retrieval is made by using a thesaurus of word vectors for a corpus of documents to generate a document context vector based on the word vectors thesaurus and a query context vector that is also based on the word vectors thesaurus. The documents in the corpus are ranked based on the correlation between the document context vector and the search query context vector.

The '785 Patent, entitled "Moving Viewpoint with Respect to a Target in a Three-Dimensional Workspace," is directed to changing the viewpoint of a perceived three-dimensional image presentation on a display. The patent describes the apparent motion of the viewpoint of the image presentation on the display and the apparent motion of a point of interest on the image. When viewpoint motion is invoked, there is apparent motion of the image presentation on a display wherein the image presentation appears to rotate. When point of interest motion is invoked, there is apparent radial motion along the line of sight to zoom in on the image presentation. The apparent motion is invoked by a user through an input device such as a mouse or keyboard. Each change of viewpoint motion and point of interest motion can be invoked individually. For example, the change of viewpoint motion can be invoked either with the point of interest remaining at a fixed distance or as the point of interest is also being moved. When the change of viewpoint motion and point of interest motion are invoked together, the presentation can appear to be rotating as zooming is occurring.

APPLICABLE LAW

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312

(Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). In claim construction, courts examine the patent's intrinsic evidence to define the patented invention's scope. *See id.*; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). This intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id*. Other asserted or unasserted claims can also aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id*. Differences among the claim terms can also assist in understanding a term's meaning. *Id*. Courts presume a difference in meaning and scope when a patentee uses different phrases in separate claims. *Id*. at 1314–15. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id*. However, the doctrine of claim differentiation is not a "hard and fast rule," and courts cannot use the doctrine to broaden claims beyond their correct scope, determined in light of the intrinsic record and relevant extrinsic evidence. *Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1369 (Fed. Cir. 2005); *see also Phillips*, 415 F.3d at 1312–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id*. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id*. (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id*. Also, the specification may resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex, Inc.*, 299 F.3d at 1325. But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent.").

Although extrinsic evidence can be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand

the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id*. at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition is entirely unhelpful to a court. *Id*. Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id*.

The patents in suit also contain means-plus-function limitations that require construction. Where a claim limitation is expressed in "means plus function" language and does not recite definite structure in support of its function, the limitation is subject to 35 U.S.C. § 112, ¶ 6. *Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). In relevant part, 35 U.S.C. § 112, ¶ 6 mandates that "such a claim limitation 'be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.'" *Id*. (citing 35 U.S.C. § 112, ¶ 6). Accordingly, when faced with means-plus-function limitations, courts "must turn to the written description of the patent to find the structure that corresponds to the means recited in the [limitations]." *Id*.

Construing a means-plus-function limitation involves multiple inquiries. "The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). Once a court has determined the limitation's function, "the next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id*. A "structure disclosed in the specification is 'corresponding' structure only if the specification or

prosecution history clearly links or associates that structure to the function recited in the claim." *Id*. Moreover, the focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id*.

CLAIM TERMS

The '819 Patent

"thesaurus"

Claims 1, 25, 27, 28, and 31 of the '819 Patent contain the term "thesaurus." IPI contends that "thesaurus" means: "A data structure that defines semantic relatedness between words. It is typically used in information retrieval to explain search terms with other closely related words. Even if the thesaurus is not explicitly computed, the mapping performed by query expansion explicitly defines a thesaurus." Google contends that the term means "a data structure that defines semantic relatedness between words." The language in both parties' proposed constructions is taken directly from the specification. '819 Patent, col. 1:51–56. However, the parties dispute whether the construction requires the inclusion of two additional sentences from the specification that discuss how a thesaurus is generated and used**.**

IPI contends that the inclusion of the last two sentences in its proposed construction are important to clarify that the '819 Patent teaches a "thesaurus" both implicitly and explicitly. IPI asserts that the mapping performed by query expansion defines a "thesaurus" even when one is not explicitly computed and thus, the construction of the term should include this important aspect of a "thesaurus." Google contends that the term is explicitly defined in the specification to mean "a data structure that defines semantic relatedness between words." Google argues that neither the

asserted claims nor the summary of the invention or detailed description in the specification mention "query expansion." Google further argues that IPI's proposed construction attempts to expand the reach of the claims by including a description of "how" thesauri are generated in the prior art, instead of defining what a thesaurus is. The Court agrees with Google that the inclusion of the additional discussion of "how" a thesaurus is generated and used is beyond the scope of the definition of the term set forth in the specification. Accordingly, the Court adopts Google's proposed construction and construes the term "thesaurus" to mean "a data structure that defines semantic relatedness between words."

"word vector"

Claims 1, 25, 27, 28, and 31 of the '819 Patent contain the term "word vector." IPI contends that "word vector" means: "A representation corresponding to co-occurrence patterns and relationships between words. The word vectors represent co-occurrence patterns and relationships between word neighbors." Google contends the term means "a column or row of numbers with each number representing the number of times a particular word co-occurs with each other word within a range of words in a corpus of documents; also known as a 'thesaurus vector.'" The parties' dispute centers around whether the term "word vector" is used in a strict mathematical sense in the specification.

IPI's proposed construction is derived from the '819 Patent Abstract: "The word vectors represent global lexical co-occurrence patterns and relationships between word neighbors." IPI argues that "[a] 'word vector' is simply a representation of the co-occurrence patterns of the words in a document" and nothing in the specification requires that this representation be limited to a number or "the number of times a particular word co-occurs" with another word. IPI's Opening

Brief, at 6–7. Google argues that IPI's proposed construction is overly broad in that it would cover representations of co-occurrence patterns that have nothing to do with the patented technology, such as a representation of co-occurrence patterns in prose (e.g., "[I]n this brief, 'claim' occurs more frequently with 'construction,' than with debtor.'"). Google's Responsive Brief, at 11. Further, Google argues that IPI's proposed construction "would result in 'word vectors' that would simply not work to perform the claimed methods" because "as the claims and specification make clear, the co-occurrences are *counted*." *Id*. at 12.

Indeed, Google argues that the term "vector" has a precise mathematical definition and thus, one of ordinary skill in the art would understand "word vector" to be numeric in nature. Google supports its assertion with both the claim language and the specification. Claim 1 recites in part, "recording a *number* of times a co-occurring word co-occurs in a same document . . ." and "generating a word vector for the word based on every recorded *number*." In addition, the specification states:

> The first preferred embodiment requires the formation of a co-occurrence-based thesaurus, which is formed by computing and collecting a (symmetric) term-by-term matrix C. Each element c_{ij} of matrix C records *the number of times that words i and j co-occur in a window of size k.*

'819 Patent, col. 14:39–43 (emphasis added). Further, Google argues that *Dimensions of Meaning*, the inventor's article cited in the '819 Patent, explains how vectors representing the relationship between words are generated from a matrix or array of numbers based on co-occurrence patterns.

The Court agrees with Google that IPI's proposed construction is overly broad in referring merely to a "representation" because the specification indicates that a "word vector" is a particular form of representation of lexical co-occurrence patterns. In addition, IPI's use of the phrase "word

neighbors" in the second sentence of its proposed construction serves to confuse rather than clarify the construction. On the other hand, contrary to Google's basic premise, although the term "vector" has a generally understood meaning of a variable quantity that can be resolved into components, such as a matrix of numbers, it is not used in that strict of a mathematical sense in the specification. However, from the claim language and the specification, it is clear that the term "word vector" is numerical in nature. Accordingly, the Court rejects both parties' proposed constructions and construes the term "word vector" to mean "a variable numerical quantity, which can be resolved into components, that provides a representation of a lexical co-occurrence pattern."

"lexical co-occurrence" and "co-occurrence of words"

Claim 1 of the '819 Patent contains the term "lexical co-occurrence," and claims 1, 25, 27, 28, and 31 contain the term "co-occurrence of words." The parties disagree as to whether the term "lexical co-occurrence," located in the preamble to claim 1, is a limitation and thus, requires construction. A preamble is limiting if it includes the "essence of the invention," *Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003), or if it is necessary to "give life, meaning, and vitality" to the claim, *Inirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295–96 (Fed. Cir. 2004). The preamble specifies that the method of generating a thesaurus of words vectors is "based on lexical co-occurrence of words within documents." '819 Patent, col. 24:39–40. In addition, the specification indicates that "the invention determines the co-occurrence patterns of words in a document to form a thesaurus of word vectors." '819 Patent, col. 1:10–12. Accordingly, the term "lexical co-occurrence" gives life, meaning, and vitality to the body of the claim by describing how the "thesaurus" is generated and thus, is a limitation.

The parties agree that the terms "lexical co-occurrence" and "co-occurrence of words" should

be consolidated and construed consistently. IPI contends that the terms mean: "Two or more words or terms which appear in text within some distance of each other. Two terms lexically co-occur if they appear in text within some distance of each other." Google contends that the term means "the appearance of two words within a specified range of each other." Further, the parties' proposed constructions differ only in the phrasing of the "distance" language—IPI contends the words appear "within some distance of each other," while Google contends that the words appear "within a specified range of each other."

Google argues that IPI's proposed construction, although taken from the specification, omits a critical clause which highlights the requirement that the distance between words be a "specified range" or window of predetermined size of words: "Two terms lexically co-occur if they appear in text within some distance of each other, *i.e., a window of k words.*" '819 Patent, col. 4:29–31. IPI argues that "[t]he distance between the two words can, but need not, be a specified range of words." In support of its argument, IPI cites to *Dimensions of Meaning*, where the inventor stated that "co-occurrence can be defined with respect to window of a given size or on the basis of sentence boundaries." IPI's Opening Brief, Exhibit C, at 787, § 1, col. 2. In addition, IPI argues that Google's proposed construction reads in limitations from a claim 1 limitation, which states "recording a number of times a co-occurring word co-occurs in a same document *within a predetermined range* of the retrieved word." '819 Patent, col. 24:45–47 (emphasis added). IPI reasons that the "predetermined range" limitation in claim 1 should not be read as a limitation because "[l]ogically, words could co-occur within some distance outside of the predetermined range," even though "[t]he claim governs which co-occurring words are recorded, i.e., those within a predetermined range." IPI's Reply Brief, at 4.

Google's use of the phrase "specified range" is overly limiting with respect to the specification's disclosure of "a window of k words." '819 Patent, col. 4:29–31. Moreover, while IPI's use of the phrase "within some distance of each other" does not adhere to the specification's disclosure of "a window of k words," the second sentence of IPI's proposed construction approximates the boundary of a window of words. However, IPI's proposed construction is unnecessarily verbose. Thus, the Court rejects both parties' proposed constructions and construes the terms "lexical co-occurrence" and "co-occurrence of words" to mean "two words that appear in text within some distance of each other."

"corpus of documents"

Claims 1, 25, 27, 28, and 31 of the '819 Patent contain the term "corpus of documents." IPI contends that "corpus of documents" means "a collection of documents which are available to an information retrieval system." Google contends that the term means "a collection of documents on a particular subject matter or from a particular source." The parties' main dispute centers around whether "corpus of documents" should be limited to a collection of documents "on a particular subject matter or from a particular source."

IPI contends that neither the claims nor the specification of the '819 Patent support limiting the term as Google proposes. IPI further argues that Google's proposed construction seeks to limit the claimed "corpus of documents" to preferred embodiments in the specification which are directed to documents on a particular subject matter (e.g., computer science) and from a particular source (e.g., New York Times). *See* '819 Patent, col. 1:39–41, col. 13:35–37 and col. 16:44–46. In support of its proposed construction, Google asserts that it is not seeking to limit the claimed "corpus of documents" to a collection of documents on any particular subject or from any particular source

described in the specification. Instead, Google contends it "only seeks to limit the definition to the well-known concept in the field"—that a "corpus" is a collection of documents on a particular subject matter or from a particular source. Google's Responsive Brief, at 16.

Google further argues that its proposed construction is consistent with the patent's teaching that the "thesaurus must be tuned to the corpus of *documents*—a concept that makes no sense if the 'collection' consists of documents unrelated to each other by source or subject matter." *Id*. (emphasis added). Google's argument is misplaced. The specification states that the "thesaurus must be tuned to the corpus of *interest*," not to the "corpus of *documents*." '819 Patent, col. 1:46–47. The claim term "corpus of documents" is broader in scope than the "corpus of interest." In other words, simply because the specification states a thesaurus must be tuned to the "corpus of interest," does not mean it must be tuned to the entire "corpus of documents." The logic of Google's argument does not follow from the correct language of the specification.

Moreover, the specification identifies two problems in the prior art: an ambiguity problem and a synonymy problem. '819 Patent, col. 1:18–26. The synonymy problem refers to the situation where a query may miss relevant documents that use words synonymous to words in the query. The ambiguity problem refers to the situation where a query may share the same ambiguous word with a document, but the words are used in a different sense. This results in a false similarity match. Google argues that the '819 Patent teaches the ambiguity problem is solved by tuning the thesauri to the "corpus of interest." However, when the specification identifies two different problems in the prior art, it is not necessary for every claim in the patent to address both problems. *See Honeywell v. Victor*, 298 F.3d 1317, 1325–26 (Fed. Cir. 2002); *Resonate v. Alteon*, 338 F.3d 1360, 1367 (Fed. Cir. 2003); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 908 (Fed. Cir. 2004) ("The fact that

a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives."). Thus, claim 1 of the '819 is not limited to solving both the ambiguity problem and the synonymy problem.

The specification does not support the narrow focus of Google's proposed construction limiting "corpus of documents" to a collection of documents on a particular subject matter or from a particular source. Furthermore, IPI's use of the word "available" in its proposed construction is vague as it does not clarify what it means for documents to be "available" to an information retrieval system. However, in view of the claim language and the specification, it is clear that IPI's use of the term "available to" is used in the sense of "accessed by." Accordingly, the Court construes the term "corpus of documents" to mean "a collection of documents which can be accessed by an information retrieval system."

"range"

Claim 1 of the '819 Patent contains the term "range." IPI contends that the term means "the distance of text around a retrieved word," while Google contends the term means "a window of contiguous words." The parties disagree as to whether the claimed "range" covers a distance "measured in the number of words, . . . characters, . . . sentences[,] or paragraphs" or whether the "range" is limited to "contiguous words."

Google asserts that the claim language clearly shows that "range" should be defined in terms of contiguous words only. For instance, claim 1 recites the steps of "recording a number of times a co-occurring word co-occurs in a same document within a predetermined range of the retrieved word" and "repeating the recording step for *every* co-occurring word located within the predetermined range for each occurrence of the retrieved word in the corpus." '819 Patent, col.

24:45–50 (emphasis added). IPI counters that the word *every* in the claim language relates to the co-occurring words, not the predetermined range. Indeed, there is nothing in the specification that states that the predetermined range must be a "contiguous" string of words. IPI further argues that '819 Patent teaches the elimination of certain "stop words," such as "the" or "an," from the process. *See* '819 Patent, col. 15:51–53 ("For example, the B-subset contains the 20,000 most frequent words, excluding stop words.") and col. 20:57–60 ("Many words in the Tipster topic descriptions are not relevant for the query in question, but they should not be placed on a stop list either because they could be relevant for other queries."). In light of the foregoing, there is no basis in the claim language or the specification to limit "range" to "a window of contiguous words."

IPI's proposed construction is consistent with the specification and the claim language. However, the Court modifies IPI's proposed construction slightly to make it clearer to the fact finder. Accordingly, the Court construes the term "range" to mean "the distance within a body of text surrounding a retrieved word."

"context vector"

Claims 25, 27, 28, and 31 of the '819 Patent contain the term "context vector." IPI contends the term means "a value corresponding to a combination of the sums of thesaurus vectors of words used." Google contends the term means "a combination of all word vectors for each word in a document or in a query."

The specification defines "context vector" as "a combination of the weighted sums of the thesaurus vectors of all the words contained in the document." '819 Patent, col. 5:5–7. The specification also states that "[t]he document vectors that are computed are called 'context vectors'" and a context vector "is the sum of the thesaurus vectors for the words in its text." '819 Patent, col.

17:16–20. IPI acknowledges that the term is defined in the specification, but does not accurately state the definition in its proposed construction. Google's proposed definition fails to specify that a "context vector" is a combination of the "sums" of the thesaurus vectors, as specifically stated in the specification. Further, Google's proposed construction uses "word vector" instead of "thesaurus vector," arguing that the '819 Patent uses "word vector" and "thesaurus vector" interchangeably and thus, the terms are synonymous. IPI argues that "[a] 'thesaurus vector' is a type or use of a word vector but the reverse is not necessarily true, i.e., all word vectors need not be thesaurus vectors." IPI's Reply Brief, at 5–6. IPI further contends that "thesaurus vector" does not appear in any of the claims and it is not the job of this Court to construe words in the specification. The Court agrees that the construction of the term "thesaurus vector" is not before the Court and neither party has provided any compelling argument why the Court should deviate from the express definition set forth in the '819 Patent. *See Phillips*, 415 F.3d at 1321 ("the specification 'acts as a dictionary when it expressly defines terms used in the claims'"). Accordingly, the Court construes the term "context vector" to mean "a combination of the weighted sums of the thesaurus vectors of all the words contained in the document." To the extent that the claim term "context vector" arises at trial, the parties will need to present evidence of what a "thesaurus vector" is, and whether it is synonymous with "word vector."

"correlation coefficient"

Claims 25, 27, 28, and 31 of the '819 Patent contain the term "correlation coefficient." IPI contends the term means "a value representing or corresponding to the degree to which two variables are similar, e.g., the degree of difference or similarity between a query context vector and a context vector for a given document." Google contends the term means "a calculated number using a cosine

function comparing the context vector of the words in a query and the context vector of the words in a document in the corpus of documents." The parties disagree as to whether "correlation coefficient" should be limited to a "cosine function."

IPI contends that the "correlation coefficient" is "simply a determination of the relative similarity and difference between the query or document context vectors" that is used to rank the documents. IPI's Opening Brief, at 15. IPI argues that although the "value" used to rank the documents can be a number, there are other ways to represent the similarity and differences, such as "a Boolean condition, a logic statement, or a log." *Id*. Thus, IPI opposes limiting "correlation coefficient" to a number, and particularly to a "number using a cosine function."

Google argues that "[w]here as here, the specification makes clear that a claim term necessarily involves a certain feature, *Phillips* requires the claim construction to include that feature." Google's Responsive Brief, at 19. Google contends that the specification consistently shows that a "correlation coefficient" is computed using a cosine function, '819 Patent, col. 18:26–33, and further cites to extrinsic evidence confirming the use of a cosine function. However, a preferred embodiment disclosed in the specification is not a claim limitation, and the Court refuses to import the cosine function limitation from the preferred embodiment into the claims. *See Phillips*, 415 F.3d at 1323.

Further, IPI asserts that the doctrine of claim differentiation precludes limiting the "correlation coefficient" as Google suggests. Although claim 25 does not specifically require that the "correlation coefficient" be calculated using a cosine function, dependent claim 26 does require computation using a cosine function. Thus, IPI contends that the "correlation coefficient" in independent claim 25 should not be limited to the specific embodiment claimed in claim 26.

Because courts presume a difference in meaning and scope when a patentee uses different phrases in separate claims, the doctrine of claim differentiation applies in this case and "correlation coefficient" is not limited to calculation by only a cosine function. *See Phillips*, 415 F.3d at 1314–15.

IPI's proposed construction is consistent with the specification and the claim language, but the attached example is unnecessary because the claim language clearly indicates that the "correlation coefficient" compares the query context vector and the context vector for a given document. Accordingly, the Court construes the term "correlation coefficient" to mean "a value representing or corresponding to the degree to which two variables are similar."

The '785 Patent

"point of interest"

Claims 52 and 55 of the '785 Patent contain the term "point of interest." Though this term was originally disputed, prior to claim construction briefing, the parties agreed that the term means "a point indicated by the user and relative to which the viewpoint can move." This definition comes straight from the specification of the '785 Patent and is adopted accordingly.

"viewpoint coordinate data"

Claims 1 and 52 of the '785 Patent contain the term "viewpoint coordinate data." IPI contends the term means "information representing the position of the viewpoint in a three dimensional workspace." Google contends the term means "the position on the x-axis, the y-axis, and the z-axis in a three-dimensional workspace from which the workspace is viewed." The parties disagree as to what "coordinate" means.

IPI contends that the term refers to "information representing" a position and argues that the specification supports such a construction. Specifically, IPI cites to two specific portions of the

specification. First, the specification provides:

> In order to present a three-dimensional workspace, a system may store data indicating "coordinates" of the position of an object, a viewpoint, or other display feature in the workspace. Data indicating coordinates of a display feature can then be used in presenting the display feature so that it is perceptible as positioned at the indicated coordinates.

'785 Patent, col. 6:56–62. The specification goes on to state that "[v]iewpoint data structure [] can include coordinate data indicating a position of the viewpoint within the three-dimensional workspace." '785 Patent, col. 14:9–15. Google argues that IPI's proposed construction is overly broad in that not all position information is "coordinate data." For example, Google argues that "to the left" or "above the table" is "information representing the position of the viewpoint," but they are not coordinates. Google's Responsive Brief, at 24. At the hearing, the Court indicated that "information representing" was too broad and IPI agreed to an alternate construction of "data representing the position of the viewpoint in a three-dimensional workspace."

Google's proposed construction includes a reference to Cartesian coordinates (e.g., x-axis, y-axis, and z-axis), which Google argues is supported by the specification's use of Cartesian coordinates to compute the coordinates of the viewpoint. IPI argues that Google's proposed construction seeks to limit the claims "to a preferred embodiment of an 'x,y, and z' coordinate system despite the fact that such a limitation is not called for by the claims." IPI's Reply Brief, at 7. A preferred embodiment disclosed in the specification is not a claim limitation, and the Court refuses to import the Cartesian coordinates limitation from the preferred embodiment into the claims. *See Phillips*, 415 F.3d at 1323. In addition, as indicated by IPI's cited portions of the specification, the specification does not limit "viewpoint coordinate data" to Cartesian coordinates. Instead, the specification simply describes the invention in terms of coordinates in a three-dimensional

workspace. *See* '785 Patent, col. 14:9–15 and col. 6:56–62.

Google's proposed construction is too narrow in light of the specification. Thus, in order to give the term the greatest amount of breadth consistent with the specification, the Court construes the term "viewpoint coordinate data" to mean "data representing the position of the viewpoint in a three dimensional workspace."

"user input means for providing signals"

Claim 52 of the '785 Patent contains the term "user input means for providing signals." The parties agree that the term is a means-plus-function limitation that should be construed pursuant to 35 U.S.C. § 112, ¶ 6. The parties also agree that the function of the "user input means for providing signals" should be construed to mean "providing signals." However, the parties disagree as to the scope of this function and the corresponding structure for the claim element.

The Court's first task is to determine the function of the means-plus-function limitation. IPI contends the function of the "user input means for providing signals" is "providing signals based on actions of a user," while Google contends the function is "providing signals requesting viewpoint motion and point of interest motion." The relevant portion of the specification provides:

> "User input means" is means for providing signals based on actions of a user. User input means can include one or more "user input devices" that provide signals based on actions of a user, such as a keyboard or a mouse. The set of signals provided by user input means can therefore include data indicating mouse operation and data indicating keyboard operation.

'785 Patent, col. 5:56–62. IPI's proposed construction of the "user input means" function comes directly from the specification: "providing signals based on actions of a user." IPI argues that the inventors acted as their own lexicographers in defining the meaning of a claim element and thus under *Phillips*, the definition in the specification should control. IPI's Opening Brief, at 20 (citing

Phillips, 415 F.3d at 1316). Google's proposed construction of the function is derived from the language of claim 52, which requires the "user input means" to provide "motion requesting signals," which request "viewpoint motion and point of interest motion." '785 Patent, col. 26:42–44.

Both parties' proposed constructions of the "user input means" function are improper. As an initial matter, the "based on the actions of a user" language in IPI's proposed construction is captured in the claim through other limiting language and is not necessary in the term's construction. *See* '785 Patent, col. 26:38–47. Moreover, IPI seeks to limit the "providing signals function" based on the specification, while Google seeks to limit the function based on the claim language. While the specification can supply understanding of unclear claim terms, it should never trump the clear meaning of the claim terms. *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433, 7 USPQ2d 1129, 1131 (Fed. Cir. 1988). The specified function in the claim is "providing signals." There is no basis accruing from the further language of claim 52 as to the "user input means" to modify and essentially re-write the specified function as Google's proposed construction seeks to do. Accordingly, the specified function for the "user input means" is "providing signals," and nothing more.

Now that the Court has determined the limitation's function to be "providing signals," the next step is to determine the corresponding structure disclosed in the specification and equivalents thereof. IPI contends the corresponding structure is "one or more user input devices that provide signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove or other input device and each of their equivalents." Google contends the corresponding structure is "one or more user input devices that provide separate signals based on actions of a user, such as a keyboard, a mouse, a multidimensional input device such as a VPL glove

or other input device and each of their equivalents." The parties' only dispute as to corresponding structure is whether the signals must be "separate."

Google argues that its proposed construction calling for separate signals is supported by the plain language of claim 52 because it uses the plural term "signals" and thus suggests that the signals that request viewpoint motion and point of interest motion are separate. Google contends that "every input device of combination of input devices disclosed in the '785 [P]atent provides signals requesting viewpoint motion or point of interest motion as 'separate' signals." Google's Responsive Brief, at 26. Google further contends that there is simply no disclosure of a single signal that affects, or that can request, both viewpoint motion and point of interest motion. IPI counters that the user input means can provide all the signals necessary for the use of the system—whether in the form of individual signals or signal sets. The claim language explains that the system "receiv[es] a first motion requesting signal set from the user input means, . . . requesting a first viewpoint motion and a first point of interest motion." '785 Patent, col. 26:57–60. Thus, IPI argues that the claim language does not mandate that the signals be separate.

Google's inclusion that the user input device structure provide separate signals is misplaced for several reasons. First, the proposed construction essentially adds an additional function requirement that is not specified in the claim as written (i.e., providing *separate* signals). Second, Google's proposed construction of corresponding structure is leveraged off its incorrect construction of the function to include "requesting viewpoint motion and point of interest motion." Because the Court found Google's proposed construction of the "user input means" function to be improper, there is no basis for the inclusion of "separate" in its corresponding structure. Third, the approach mandated by 35 U.S.C. § 112, ¶ 6 does not require that the Court make a determination as to what

structure is absent from the specification that could otherwise perform the function. Finally, the use of the plural term "signals" in the claim language does not alone signify that the signals produced must be "separate." The further limiting claim language in the preamble, as written, is controlling as to the claimed signals. However, as to the "user input means," the indication in the specification of "one or more" precludes limiting the structure to two devices producing separate signals.

IPI correctly sets forth the scope of the corresponding structure, with two exceptions. First, there is no basis for inclusion of the catchall phrase "or other input device" in the identified corresponding structure. Second, the phrase "that provide signals based on actions of a user" is unnecessary as it relates to function, rather than structure. Accordingly, the corresponding structure for the "user input means" is "one or more user input devices including a keyboard, a mouse, and a multidimensional input device such as a VPL glove, and each of their equivalents."

"the user can request viewpoint motion and point of interest motion independently"

Claim 52 of the '785 Patent contains the term "the user can request viewpoint motion and point of interest motion independently." IPI contends the term means "the user can request viewpoint motion and/or point of interest motion separately or simultaneously." Google contends the term means "the user can request viewpoint motion and point of interest motion separately and simultaneously." The parties dispute whether *both* requests must occur separately *and* simultaneously.

IPI argues that its proposed construction is supported by the specification, which states that "[u]ser input means can include *one or more* 'user input devices' that provide signals based on actions of a user, such as a keyboard or a mouse." '785 Patent, col. 5:57–60 (emphasis added). The specification goes on to describe how the signals are requested:

> Signals from user input means can request motion of the viewpoint and motion of the POI. If the user can request viewpoint *and* POI motion separately *and* can request both types of motion simultaneously, the user input means is structured so that the use[r] can request viewpoint motion and POI motion "independently."

'785 Patent, col. 8:5–10. IPI interprets this to mean that "the user could request viewpoint motion, point of interest motion, or viewpoint motion and point of interest motion." IPI's Opening Brief, at 24. Thus, the specification teaches that the user can request viewpoint motion and point of interest motion "independently" of each other. Google counters that IPI's proposed construction "disowns" the invention described in the specification by changing "and" to "and/or" and "or," and IPI's attempt to expand the reach of the claim limitation is simply unsupported. Google's proposed construction requires that the user be able to request both viewpoint motion and point of interest motion separately as well as simultaneously. IPI asserts that it "is at a loss for how a claim element whose plain meaning requires that a request for motion independently must also occur simultaneously." IPI's Reply Brief, at 8–9.

It appears the parties are saying the same thing in different words. The parties only get into a semantic dispute, especially in regard to inclusion of "simultaneously" in the constructions, because the specification uses "independently" in a somewhat garbled description. In view of the specification and the claim language, it is clear that the user *can* request viewpoint motion and point of interest motion separately, simultaneously, or separately and simultaneously. However, neither the specification nor the claim language *require* that the user request viewpoint motion *and* point of interest motion separately *and* simultaneously.

The plain and ordinary meaning of "independently" as used in the claim language is "individually." The specification, particularly in view of the example given of using one hand to

request point of interest motion and the other hand to request viewpoint motion (i.e., individually), is consistent with this meaning. *See* '785 Patent, col. 8:11–14. Thus, the Court construes the term "the user can request viewpoint motion and point of interest motion independently" to mean "the user can individually request viewpoint motion and point of interest motion." Although the Court finds that it is not necessary to include any reference to "separately" and "simultaneously" in the term's construction, it has nevertheless resolved the parties' dispute in accordance with *O2 Micro International Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1351 (Fed. Cir. 2008). To the extent that this claim term arises at trial, the Court instructs the parties to tailor their trial arguments to conform with this Order.

"motion requesting signal set"

Claim 52 of the '785 Patent contains the term "motion requesting signal set." IPI contends the term means "signals representative of data for viewpoint motion and/or point of interest motion in a three-dimensional workspace." Google contends the term means "a group of commands indicating a point of interest motion and a viewpoint motion relative to the point of interest."

The term "motion requesting signal set" appears in claim 52 in the following context: "receiving a first motion requesting signal set from the user input means, the first motion requesting signal set requesting a first viewpoint motion and a first point of interest motion." '785 Patent, col. 26:57–60. IPI argues that a preferred embodiment of the patented invention includes at least two different types of signal sets: (1) a signal set requesting viewpoint motion relative to a stationary point of interest and (2) a signal set requesting both viewpoint motion and point of interest motion. IPI's Opening Brief, at 25. However, this statement is not completely accurate. The preferred embodiment includes only a single signal set, but that content of the signal set may request either (1)

only viewpoint motion relative to a stationary point of interest or (2) both viewpoint motion and point of interest motion. *See* '785 Patent, col. 9:27–37.

Google again takes issue with IPI's inclusion of "and/or" in its proposed construction. However, here it is clear that IPI uses "and/or" to indicate that one type of motion requested by the signal set may be "no motion." For example, a signal set requesting viewpoint motion and no point of interest motion would result in only viewpoint motion relative to a stationary point of interest. However, the "and/or" language in reference to the two types of motions is unnecessary in view of the further claim language specifying the two types of motion that can be requested. '785 Patent, col. 26:57–60 ("the first motion requesting signal set requesting a first viewpoint motion and a first point of interest motion"). Google's proposed construction suffers from the same error. Further, Google's reference to "a group of commands" deviates from the plain language of the claim and specification which describe the requests in terms of "signals" or "signal sets."

Accordingly, the Court rejects both parties' proposed constructions and construes the term "motion requesting signal set" to mean "data indicating a user's request for movement of an image presentation on a display." Other recitations in the claim control any further limitations such as those addressed by the parties' proposed constructions.

"viewpoint motion"

Claims 1, 28, 42, and 52 of the '785 Patent contain the term "viewpoint motion." IPI contends the term means "a sequence of images that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint." Google contends the term means "a sequence of images that causes the viewpoint to appear to move from an initial position to other positions." The parties dispute whether the specification adequately defines the term and whether the term's

construction requires inclusion of references to a three-dimensional workspace and viewpoint displacement.

IPI contends its proposed construction is taken directly from the specification, which states: "'Viewpoint motion' or 'viewpoint displacement' occurs when a sequence of images is presented that are perceptible as views of a three-dimensional workspace from a moving or displaced viewpoint." '785 Patent, col. 7:41–44. IPI contends that the inventors acted as their own lexicographers and thus, that definition should be adopted as the appropriate construction. Further, IPI points to other portions of the specification that support this proposition. IPI's Opening Brief, at 26–27. Google counters that IPI's proposed construction is unnecessarily complicated and confusing because other portions of the claim already require that the views be of a three-dimensional workspace. *See e.g.*, '785 Patent, col. 20:39–42 ("presenting a first image on the display; the first image including a first surface that is perceptible as viewed from a first viewpoint within a three-dimensional workspace"). Google further contends that IPI's inclusion of the concept of a "displaced viewpoint" is unsupported because "displaced" is not co-extensive with "motion."

Both parties' proposed constructions set forth "when" and "how" "viewpoint motion" occurs, i.e., by a sequence of images. Although the specification describes the operation of "viewpoint motion," a description of the operation does not constitute a definition of the term as to what "viewpoint motion" is. The specification's description of Figures 2A and 2B of the '785 Patent is particularly useful in defining "viewpoint motion." The relevant portion of the specification provides:

> FIG. 2A shows image 20, within which surface 10 is perceptible as viewed from viewpoint 14 in a three-dimensional workspace. FIG. 2B shows image 22, with surface 24 including point 26 in a circle. By presenting an appropriate sequence of

> images, surface 24 can be perceptible as a continuation of surface 10 but viewed from a different viewpoint in the three-dimensional workspace. When a user indicates point 16 and requests viewpoint movement towards point 16, a system presenting image 20 can respond with a sequence of images ending in image 22 so that the user can see point 26, perceptible as a continuation of point 16, and the surrounding area in greater detail.

'785 Patent, col. 9:11–23. In light of the claim language and the specification, the Court proposed the following construction for "viewpoint motion" to the parties at the hearing: "perceived movement of an image presentation on a display." IPI's only objection to this proposed construction was that it did not cover "displacement" of the viewpoint. Although "motion" may include "displacement," they are not the same. Further, there is no support in the claim language or the specification to include the concept of "displacement" in the construction of the term "viewpoint motion." Google's only request was that the proposed construction clarify that the "viewpoint" of the image is what is moved, not the image itself. Google's requested clarification is consistent with the claim language and the specification. Accordingly, the Court construes the term "viewpoint motion" to mean "perceived movement of the viewpoint of an image presentation on a display."

"point of interest motion"

Claim 52 of the '785 Patent contains the term "point of interest motion." IPI contends the term means "a sequence of images that are perceptible as views of a three-dimensional workspace including a moving or displaced point of interest." Google contends the term means "a change in location of the point of interest as indicated by a user."

As an initial matter, IPI's reference to "displaced" point of interest is improper for the same reasons explained in the Court's construction of "viewpoint motion." Further, IPI's entire proposed construction suffers from the same fatal flaw as its proposed construction for "viewpoint motion."

That is, its proposed construction sets forth "when" and "how" "point of interest motion" occurs, rather than identify what "point of interest motion" is. Although Google's proposed construction for "point of interest motion" does not carry forward with the same flawed approach, it unnecessarily includes reference to a user. Google contends that in order for a point to be "of interest," it must be "of interest" to the user. Claim 52 already recites that the request for "point of interest motion" comes from the "user input means." '785 Patent, col. 26:38–47. Thus, there is no need to state "as indicated by a user," as Google proposes. Lastly, Google's use of "change in location" suffers from the same flaw as IPI's inclusion of "displacement." "Change in location" is narrower than the claim term "motion" and it would be improper to narrow "point of interest motion" to simply "a change in location of the point of interest."

Claim 52 uses "point of interest motion" in the same manner as "viewpoint motion" is used in other claims of the '785 Patent. Thus, the Court's construction of the term "point of interest motion" should mirror that of "viewpoint motion." Accordingly, the Court construes the term "point of interest motion" to mean "perceived movement of a point of interest on an image presentation on a display."

"radial motion"

Claim 55 of the '785 Patent contains the term "radial motion." IPI contends the term means "motion or displacement along one or more rays," while Google contends the term simply means "perceived movement along a ray." The parties' dispute centers around whether there can be movement along more than one ray.

IPI derives its proposed construction directly from the specification, which provides: "'Radial motion' or 'radial displacement' is perceived as motion or displacement along one or more rays."

’785 Patent, col: 7:55–57. IPI argues that its proposed construction should be adopted because the inventors acted as their own lexicographers in defining the term “radial motion.” However, as Google points out, the specification goes on to clarify that “[a] ray extends from a ‘radial source.’” ’785 Patent, col: 7:55–57. IPI’s proposed construction of “radial motion” would allow the motion to take place across multiple rays in an unbounded fashion, which is unsupported by the specification and the claim language. Google interprets the specification to indicate “that although radial motion can begin along one ray and subsequently shift to take place along a different ray, to be radial, motion must be perceived as movement along a ray.” Google’s Responsive Brief, at 29–30. Google further argues that the plain language of claim 55 supports it proposed construction that “radial motion” is “perceived movement along a ray”: “The method of claim 52 in which the first viewpoint motion includes radial motion, the second viewpoint being displaced radially along a ray extending from the second point of interest through the first viewpoint.” ’785 Patent, col: 27:15–19.

Although the specification defines the term as including “motion or displacement along one or more rays,” “radial motion” along multiple rays is inconsistent with the claim language. The claim language and specification allow “radial motion” to take place along different rays, but the motion can only take place along one ray at a time. To further explain,“radial motion” can take place along one ray, then a request to move to a different point of interest can cause the “radial motion” to shift to another ray. This is illustrated in Figure 7 of the ’785 Patent:

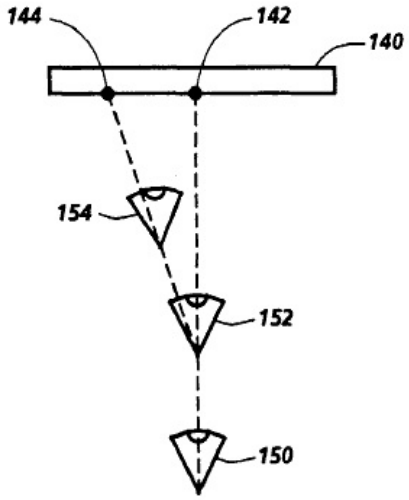

Fig. 7

Figure 7 of the '785 Patent

The specification's description of Figure 7 further supports the Court's understanding of "radial motion":

> FIG. 7 illustrates viewpoint motion together with point of interest motion. Surface 140 is perceptible in a three-dimensional workspace, and includes POI 142 and POI 144. From initial viewpoint 150, radial motion is requested toward POI 142, so that an image is presented from viewpoint 152 *on the ray from POI 142 through viewpoint 150*. Then, while the request for radial motion toward the POI continues, a request to move to POI 144 is also received, so that an image is presented from viewpoint 154 *on the ray from POI 144 through viewpoint 152*.

'785 Patent, col: 12:9–19 (emphasis added). Accordingly, the Court adopts Google's proposed construction and construes the term "radial motion" to mean "perceived movement along a ray."

"ray"

Claim 55 of the '785 Patent contains the term "ray." Though this term was originally disputed, during the hearing both sides agreed that the definition of the term is "a straight line extending from a radial source." This definition is consistent with the claim language and the specification and is adopted accordingly.

CONCLUSION

For the foregoing reasons, the Court interprets the claim language in this case in the manner set forth above. For ease of reference, the Court's claim interpretations are set forth in Appendix A.

So ORDERED and SIGNED this 7th day of January, 2010.

LEONARD DAVIS
UNITED STATES DISTRICT JUDGE

APPENDIX A

U.S. Patent No. 5,675,819

Term or Phrase	Court's Construction
"thesaurus" (Claims 1, 25, 27, 28, and 31)	a data structure that defines semantic relatedness between words
"word vector" (Claims 1, 25, 27, 28, and 31)	a variable numerical quantity, which can be resolved into components, that provides a representation of a lexical co-occurrence pattern
"lexical co-occurrence" (Claim 1)	two words that appear in text within some distance of each other
"corpus of documents" (Claims 1, 25, 27, 28, and 31)	a collection of documents which can be accessed by an information retrieval system
"range" (Claim 1)	the distance within a body of text surrounding a retrieved word
"context vector" (Claims 25, 27, 28, and 31)	a combination of the weighted sums of the thesaurus vectors of all the words contained in the document
"co-occurrence of words" (Claims 1, 25, 27, 28, and 31)	two words that appear in text within some distance of each other
"correlation coefficient" (Claims 25, 27, 28, and 31)	a value representing or corresponding to the degree to which two variables are similar

U.S. Patent No. 5,276,785

Term or Phrase	Court's Construction
"point of interest" (Claims 52 and 55)	[AGREED] a point indicated by the user and relative to which the viewpoint can move
"viewpoint coordinate data" (Claims 1 and 52)	data representing the position of the viewpoint in a three dimensional workspace
"user input means for providing signals" (Claim 52)	Function: providing signals Corresponding Structure: one or more user input devices including a keyboard, a mouse, and a multidimensional input device such as a VPL glove, and each of their equivalents
"the user can request viewpoint motion and point of interest motion independently" (Claim 52)	the user can individually request viewpoint motion and point of interest motion
"motion requesting signal set" (Claim 52)	data indicating a user's request for movement of an image presentation on a display

"viewpoint motion" (Claims 1, 28, 42, and 52)	perceived movement of the viewpoint of an image presentation on a display
"point of interest motion" (Claim 52)	perceived movement of a point of interest on an image presentation on a display
"radial motion" (Claim 55)	perceived movement along a ray
"ray" (Claim 55)	[AGREED] a straight line extending from a radial source