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VIA ELECTRONC FILING

The Honorable Leonard P. Stark
United States District Court
844 King Street
Wilmington, Delaware 19801

> Re: *Personalized User Model LLP v. Google Inc.,* **C.A. No. 09-525-LPS**

Dear Judge Stark:

I am writing on behalf of Google in response to Plaintiff PUM's January 19, 2011 letter to the Court, which raised arguments that go beyond issues raised by the parties' alternative constructions and that could have been presented at the January 11 hearing, as well as a new piece of extrinsic evidence submitted by PUM for the first time with its letter, to which Google has never had the opportunity to respond.

Specific to User/User-Specific. Cast as relating to why PUM contends "parameters of a learning machine" should be addressed first in the Court's claim construction order, PUM presents further argument as to what it means for a User Model/Learning Machine to be specific to the user/user specific. In doing so, PUM repeatedly mischaracterizes Google's constructions and arguments, necessitating a response.

First, PUM suggests that the parties' continued negotiations and Google's proposed revised construction somehow showed that Google's position is that there must be different variables for each user. (Letter, 2-3). But Google explicitly stated at the hearing this is *not* Google's position:

THE COURT: So that means -- and I know this gets somewhat into variables and parameters -- but if we are both being evaluated for our sports enthusiasm and car enthusiasm, your constructions would allow for that possibility. That is, just because you and I both have the same parameters doesn't mean that your model is not specific to you and my model specific to me.

MR. PERLSON: Right. Yes. Definitely. I mean really the only thing we're trying to get at here is we have a user model, you have a user model, and anyone else using the system has a user model.

(1/11/11 Tr., 62:11-21 (emphasis added)) Rather, as made clear in the quote above, Google's actual position—which PUM has never substantively rebutted—is that each individual user must have his or her own User Model or, in the case of the '276 patent, learning machine. (*See also id*, 61:5-62:1, 62:18-63:14, 64:8-17.)

Nor is there anything in Google's constructions that would require that a User Model must contain different variables (or parameters) for each user as PUM suggests. For example, if Alice has several web pages from Java.com in her data files, her User Model might have a "Java.com" parameter value of 0.43. (*See* '040 patent, Fig. 4B.) Bob may have also visited Java.com the same amount of times and he could also have a "Java.com" parameter value of 0.43.   While by coincidence these users' User Models contain the same parameter with the same value, Alice and Bob still each have their own User Model specific to—i.e. "unique" or "restricted" to—each of them. Alice's User Model is derived from the documents Alice looked at to model Alice's interests. Bob's User Model is derived from the documents Bob looked at to model Bob's interests. Whether or not the variables, parameters, or weights are the same or different within the models is entirely irrelevant. What makes the User Model specific to the user is that there is a different model for modeling Alice, a different model for modeling Bob, etc . . .[1]

In making its argument, PUM's references an "exemplary template function." (Ltr., 3). Such a "template" has no support in, and is in fact never mentioned in, the patent. In any event, even if relevant, nothing in Google's construction would preclude the use of such a "template." In fact Google's construction would be perfectly consistent with it. Using PUM's hypothetical, the function applied to user 1 would result in a User Model that models the interests of user 1 and is thus specific to—i.e. unique or restricted to--user 1. The function applied to user 2 would result in a separate User Model that models the interests of user 2 and is specific to—i.e. unique or restricted to--user 2.[2]

PUM also suggests that it is Google's position that the Group or Cluster Model is "a number of users sharing the same template function." (Ltr., 3). Again, however, the reference to "template functions" is a non-sequitur having nothing to do with the patent. In actuality, the portion of the specification cited by Google states "[t]he Group or Cluster Model is a function that represents the interest level of a group of users in a document independently of any specific information

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[1]   PUM's argument that "the averaging described in the specification is not plausible under Google's proposed definition because all of the User Models would have different variables" (Ltr., 3) also incorrectly assumes that Google's construction requires that all variables be different for each user. In reality, User Models will likely contain many of the same variables; for instance, most users' documents are likely to include web pages that contain the word "internet" or that originated at various popular Web locations.

[2]   PUM's argument on this point also supports Google's construction of "parameters of a learning machine," not PUM's. According to PUM, there is a "template function $f(u,v,w,x,y,z) = a*u + b*v +c*w +d*x + e*y + f*z$," and then values are given to a, b, c, d, e, and f. The letters a-f are the parameters–i.e. variables–that have values/weights that PUM assigns to them in the hypothetical. (Ltr., 3).

need." ('040 patent, 9:46-48.) Google's argument is merely that PUM's construction, which does <u>not</u> require a separate User Model for each user, is actually a Group or Cluster Model. Indeed, PUM's own citation to the specification shows the difference between "cluster models" and "individual user models": "practically, the cluster model is computed from the user models by averaging the different distributions of <u>the individual user models</u>...."[3] (25:42 (emphasis added))

Probability. PUM includes for the first time with its January 19 letter to the Court an article regarding Bayesian probabilities as purported further support of its straw man argument regarding frequentist and Bayesian probabilities. Yet, this article discusses the distinction between throwing a die and Bayesian probability in precisely the same manner Google provided at the January 11 hearing. (1/11/11 Tr., 84:21-85:16.) And contrary to PUM's implication, it is actually PUM's original and revised constructions of "probability," using the words "degree of belief <u>or</u> likelihood" (emphasis added) that could encompass both the "frequency approach" (the <u>likelihood</u> that one will roll a 3 when throwing a die is 1 out of 6) and Bayesian probability theory (how strongly someone believes in something). In other words, PUM's own constructions present the very problem PUM suggests exists in Google's construction.

More importantly, the article shows that Google's construction of "probability" as a "percentage chance" is accurate in the undisputed context of the patent. In its discussion of what the article calls "The basic rules of Bayesian probability theory," it states a "probability" is a number between 0 and 1-- i.e., between 0-100%--<u>just as Google's construction provides</u>:

The basic rules of Bayesian probability theory

The Bayesian probability theory can be based on a few simple rules. It is evident that a proposition and its negation are related. According to the sum rule their probabilities sum up to one.

Sum Rule: $P(A \mid B) + P(\neg A \mid B) = 1$

If one wishes to verify the truth of AB, one can first verify A and then verify B assuming A. Hence $P(AB \mid C)$ is evidently a function of $P(A \mid C)$ and $P(B \mid AC)$. The product rule states that this function is a product.

Product Rule: $P(AB \mid C) = P(A \mid C) P(B \mid AC)$

Probability is a real number between zero and one. The probability is not defined if the background assumptions, premisses, conflict. $P(A \mid B\neg B)$, for example, is undefined.

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[3]   Footnote 1 to PUM's letter acknowledges that the image on Google Hearing Slide 16 labeled "Patent" is consistent with Google's construction of "User Model specific to the user." That is, each user has his/her own User Model. PUM's reference to a "large man" in the same footnote, however, is another non-sequitur. The stick figures in the slides represent users; the circles represent User Models used by the users. Thus, there would be no "large man" needed to represent "the average of the User Models." Rather, the average of the User Models is *already* in the diagram—it is the Group Model itself.

(Exhibit B to PUM's 1/19/11 Letter, at 2) (emphasis added). Probabilities must be between 0 and 1 because, as stated in the article shown above, summing the probabilities of all possible outcomes must equal 1 (or 100%). For instance, if there is a 75% chance that the user is interested in a document, then there must be a (1 – 0.75) 25% chance that the user is <u>not</u> interested in the document. If there is a 40% chance of rain tomorrow, then there must be a (1 – 0.40) 60% chance that it will <u>not</u> rain tomorrow. Google's construction properly accounts for this required meaning of probability that is part of the "basic rules" of Bayesian theory upon which the patents are indisputably based. PUM's "numerically-based degree of belief or likelihood" construction, however, is specifically intended to ensnare "degrees" that are <u>not</u> probabilities in the context of the patent as shown by PUM's own evidence.

Respectfully,

/s/ Richard L. Horwitz

Richard L. Horwitz

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998025/34638

cc: Clerk of the Court (via hand delivery)
         Counsel of Record (via electronic mail)