EXHIBIT B

In The Matter Of:

Skyhook Wireless v.
Google

David Kotz, Vol. 2
October 14, 2011

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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

SKYHOOK WIRELESS, INC. *
*
vs. * Civil Action No.
* 10-cv-11571-RWZ
GOOGLE INC. *

VIDEOTAPED

D E P O S I T I O N

of

DAVID KOTZ, Ph.D. - VOLUME II

Taken on behalf of the Defendant on Friday, October 14, 2011, at the Holiday Inn Express, White River Junction, Vermont.

APPEARANCES:

SAMUEL K. LU, ESQ., of the firm Irell & Manella, 1800 Avenue of the Stars, Suite 900, Los Angeles, California, 90067-4276, appeared and represented the Plaintiff.

SUSAN BAKER MANNING, ESQ., of the firm Bingham McCutchen, 2020 K Street, NW, Washington, D.C., 20006-1806, appeared and represented the Defendant.

VIDEOGRAPHER: Eric Fernald

COURT REPORTER: Lisa M. Hallstrom, RPR, CRR, CCP

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EXHIBITS

(08:32:26-08:33:22)

(Commencing at approximately 8:32 a.m.)

VIDEOGRAPHER: On the record. Today is October 14th, 2011. The time on the monitor is 8:32. We're here at the Holiday Inn Express Hotel, White River Junction, Vermont, for a continued deposition of David Kotz in the matter of Skyhook Wireless versus Google Inc. United States District Court, District of Massachusetts, Number 10-CV-11571-RWZ. The videographer is Eric Fernald. The court reporter is Lisa Hallstrom.

Would counsel please introduce themselves and state whom you represent today.

MS. MANNING: Good morning. Susan Baker Manning of the firm Bingham McCutchen. I represent Google Inc. in this action.

MR. LU: Samuel Lu of Irell and Manella. I represent Skyhook Wireless, Inc.

E X A M I N A T I O N

BY MS. MANNING:

Q Good morning, Dr. Kotz.

A Good morning.

Q Do you understand that you are still under oath after our break from the first session of your deposition?

(08:33:23-08:34:42)

A Yes, I do.

Q And have you done anything more to prepare for your deposition since we broke on Wednesday?

A No.

Q You have with you this morning, I notice, the same green notebook, looks like the same green notebook you had on Wednesday. Can I just ask what's in it?

A Let's see. So there's a copy of my declaration and there's a copy of the four patents and there's my vita.

Q I wanted to ask you about arterial bias. Do you know one way or another whether arterial bias was a problem that was known prior to the invention of the patents in suit?

A Certainly I had never heard that term before. In fact, I hadn't heard it before reading these patents.

Q Okay.

A I'm not aware of any -- I can't recall any papers or trade literature I had seen that referred to that concept.

Q Okay. So you can't remember anything. Do you -- do you know one way or another whether it was a known concept in the art prior to the inventions of the patents in suit?

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A No.
MR. LU: Objection. Asked and answered.
A No, I don't know.
Q Are you aware of any other sources of information besides the patents themselves and the prosecution histories that we can look to to inform our understanding of the term arterial bias?
MR. LU: Objection to the extent asked and answered.
A No, I don't know of any other literature or information.
Q Okay. With reference to Claim 1 of the 988 patent, you've got it there in your notebook and we have also marked the 988 -- 988 patent as Exhibit 1007, could Claim 1 of the 988 patent cover a database with calculated position information based on access point readings that were gathered through war driving?
MR. LU: Objection. Vague. Ambiguous. Foundation. Calls for speculation.
A I -- you know, on a quick rereading of the claim I would say not likely because war driving wouldn't lead to reference symmetry or a reduction in arterial bias of the calculated information.
Q Why wouldn't it lead to reference symmetry?
MR. LU: Objection. Foundation. Vague

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and ambiguous. Calls for speculation.
A I -- I think the -- most war driving data is collected in an unstructured, unplanned way and so the collection of access points that you've observed wouldn't likely lead to reference symmetry.
Q By your use of the word likely I take it you would allow this, war driving could lead to reference symmetry in the data?
MR. LU: Same objections.
A It's possible but not probable.
Q Okay. Do you have a way of ballparking that likelihood?
MR. LU: Same objections.
A Certainly not quantifying it, but I'll refer to the common analogy of a monkey randomly typing on a typewriter. Eventually he writes all of Shakespeare so that there's always a chance that the data would be collected in a sufficient way as to produce reference symmetry, but it's unlikely.
Q So what are the factors that would -- that would lead to reference symmetry in the claimed invention that would -- would not allow you to achieve reference symmetry through war driving?
A I think the invention describes a planned, structured method of collecting the information, such

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as driving all the streets and in an effort to observe as many access points as possible from as many sides as possible.
Q And can you not cover all of the streets through a war driving method?
MR. LU: Objection. Vague and ambiguous. Foundation. Calls for speculation.
A Like I said before, it's possible, but it's not likely.
Q And the likelihood depends on, among other factors, at least the number of scanning vehicles you -- you employed in your war driving project, right?
MR. LU: Same objections.
A Yes, it would correspond to that, and other factors related to how well planned the scanning drivers were.
Q Can you -- can you practice the claimed invention of the 988 patent, Claim 1, without planning a route?
MR. LU: Objection. Vague and ambiguous. Calls for speculation.
A I'm finding it difficult to think of any way you could accomplish this without planning the route because, otherwise, you wouldn't be able to say things like so that the multiple readings have reference

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symmetry and so that the calculated position avoids arterial bias.
Q So if I'm understanding you correctly, the taking of multiple readings at locations around the access point with the result that you achieve reference symmetry and avoid arterial bias, the achievement of those things depends on collecting the data in a planned way?
MR. LU: Same objections.
BY MS. MANNING:
Q Is that a fair characterization of what you're trying to tell me?
A Reasonably fair. Of course, one would need to think about what it means to be planned. So planning could be preplanned from the start where you've mapped out your entire route before you start driving. One could imagine alternatives where you did some driving and then looked to see what you had missed and then went -- made a plan to go back and accomplish the missed parts. So planning could be an ongoing process, but it seems unlikely that you would accomplish these goals without some conscious effort to structure your scanning.
Q Okay. I believe we looked on Wednesday at some of the passages in the 988 patent that talk about

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planning a route. One of those that I know we looked at was column 8, lines 28 and following.
A That sounds familiar.
Q Okay. And you agree with me that that discusses the planning of a route?
A Yes.
Q Is there any place in the patent that talks about this, what you describe as sort of an ongoing plan or an iterative plan as opposed to preplanning the route?
MR. LU: Objection. Vague. Ambiguous.
A Not that I recall.
Q Are there any reasons other than what we've been discussing why in your view war driving could not lead to reference symmetry?
MR. LU: Objection. Vague. Ambiguous. Calls for speculation.
A So are you referring to reference symmetry --
Q Yes.
A -- is that your question?
Q Yes, sir.
A Okay. I can't think of any other reasons at this time.
Q Okay. And you gave us your view a few moments ago that war driving could not lead to the avoidance of arterial bias within the meaning of Claim 1 of the

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988 patent -- patent. Why is that?
MR. LU: Same objections.
A Well, war driving would tend to concentrate on the arteries -- concentrate the scanning effort on the arteries and, thus, the data collected would be on the artery side, as it were, of the buildings and so that would tend to bias the calculated positions toward those arteries.
Q One of the things we discussed during your first session of your deposition was your view that at least some war drivers made an effort to systematically traverse areas in order to -- to have more complete scan data. Do you recall that discussion?
A Yes.
Q And given your view that -- that that constitutes war driving, why couldn't that kind of war driving avoid arterial bias?
MR. LU: Objection. Vague. Ambiguous. Foundation. Calls for speculation.
A I think in that case if the war drivers were making plans to cover all of the streets, then in effect they would be practicing this invention. I know it's a question of terminology, right? What is war driving and what is -- what is not.
Q You have anticipated my follow-up question.

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A Okay.
Q So can you -- could you describe for me, you know, the distinction you are -- you are drawing between war drivers who would be planning a route and systematically scanning an area versus someone who is practicing the claimed invention or is there no distinction?
MR. LU: Objection. Compound. Vague.
A Well, I think the -- the term war drivers generally means to me a collection of uncoordinated volunteers who are not necessarily coordinating with each other or necessarily themselves planning their scanning efforts, but among this -- there may be a subset of those, as you implied, that are planning their routes or perhaps coordinating their efforts, and in that case I think they would be doing something similar to what's in this patent.
Q So back to my original question, which was Claim 1 of the 988 patent cover a database that has calculated position information based on access point readings that were gathered through war driving?
MR. LU: Objection. Vague. Ambiguous. Foundation. Calls for speculation. Asked and answered.
A Well, my answer doesn't really change. It's the

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same question and it relates to how one defines war driving.
Q Okay. So your definition of war driving is -- isn't -- is necessarily an unplanned approach to scanning data, is that fair to say?
A Generally, yes.
Q Okay. Anything else important to your -- your own definition that you're using as we talk here today to what constitutes war driving?
A Not that I'm conscious of.
Q Okay. And when we talked during the last session of your deposition you drew a distinction between war driving and the random model -- the random method of data collection that's discussed in the patent. Could Claim 1 of the 988 patent cover a database that has calculated position information based on access point readings that were gathered through the random method?
A No, and for largely the same reasons.
Q Okay. Any different reading -- reasons or exactly the same as what we've been discussing?
MR. LU: Objection. Vague and ambiguous.
A So I was thinking of the same reasons, the fact that the random model wouldn't lead to reference symmetry or avoiding arterial bias.
Q And is that because it's -- does not employ

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planned routes?
A Yes. The random model doesn't employ any planning as they describe it in here.
Q Any other reasons why the random model could not lead to a database consistent with Claim 1 of the 988 patent?
A Well, as they presented it in the specification, the random model places scanners on, for example, taxis and delivery vans and so forth, and those vehicles tend to concentrate their efforts on the arteries and may not cover all of the streets, likely wouldn't, and so they would end up with arterial bias and so they wouldn't accomplish the goals of Claim 1.
Q Okay. The questions I've just been asking you about war driving and the random model have been directed to Claim 1 of the 988 -- 988 patent, and I'd like to ask you about Claim 1 of the 694 patent. The 694 patent we have marked as Exhibit 1010. Do you have it there, sir?
A Yes.
Q So could Claim 1 of the 694 patent cover a database that has calculated position information based on access point readings that were gathered using war driving?
MR. LU: Objection. Vague and ambiguous.

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Foundation. Calls for speculation. Also object to the extent it's been asked and answered.
A No. It's -- it has the same problem. War driving would have the same -- would result in the same problems in this case as well.
Q Okay. So -- so your answer is no, and for the same reasons we've discussed with respect to the 988 patent?
A Yes.
Q Any different reasons?
A No, not -- not at first glance.
Q If you -- if you want a minute to think about it, I'm -- I'm happy to give you that minute.
A No.
Q Okay. Could Claim 1 of the 694 patent cover a database that has calculated position information based on access point readings that were gathered through the random method?
MR. LU: Objection. Vague and ambiguous. Calls for speculation. Foundation. Also object to the extent it's been asked and answered.
A No, and for the same reasons.
Q With respect to Claim 1 of the 694 patent, I'd

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like to ask you a hypothetical question about that. I'm a competitor. Like not to get sued by Skyhook. I'd like to design around Claim 1 of the 694 patent and, in particular, I'd like to not meet the avoids arterial bias limitation in Claim 1 of the 694 patent. How do I avoid meeting that limitation while practicing the rest of the claim?
MR. LU: Objection. Vague and ambiguous. Foundation. Calls for speculation.
A I think that would be difficult to do because you still want to achieve the reference symmetry part of the claim without achieving the arterial bias part of the claim, if I understand your -- you correctly, and a method that accomplishes the reference symmetry goal would -- at least as far as I can imagine, would probably also avoid arterial bias, but I may have not thought of a method yet that somehow does that.
Q If I understood your testimony on Wednesday, it's your view that reference symmetry in -- in the 694 patent is -- is about the general distribution of access points within the targeted area, is that right?
A Yes.
Q Okay. Why couldn't you have reference symmetry in the target area by having broad distribution of calculated locations, all of which are exactly on the

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streets exactly on the locations of the scan vehicle as it traversed the area?
MR. LU: Objection. Vague and ambiguous. Also object to the extent it's been asked and answered.
A Well, so your earlier question was -- was about whether I could think of a way that one might accomplish that and this question is about assuming that one did accomplish that having arterial bias and yet achieving reference symmetry.
Q I'm asking why -- why -- why couldn't that happen? Why isn't that a possibility? And if you think it's not a possibility, I'd be interested in hearing why.
A Yeah, right.
MR. LU: Same objections.
A I suppose it is a possibility. If you drove all the streets and made no effort to calculate the position of access points simply recording the locations along the streets, you would -- you would have a form of reference symmetry. I think you would -- it would lead to poor accuracy.
Q Is arterial bias, at least in part, a function of the quality of the algorithm used to calculate the location of the access point?

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MR. LU: Objection. Vague. Ambiguous. Foundation.
A Well, I -- it's -- I would say probably not. You know, my interpretation of arterial bias as a term is that it is a bias in the result of the calculation of the access point location caused by one scanning the arteries rather than enough points elsewhere. There, of course, are any possible number of algorithms one might use, but I don't think it would be a function of the algorithm that results in arterial bias.
Q Would you agree with me that the overall accuracy of the calculated location, how close it gets to the actual location of the access point, that's -- that's a function of the quality of the algorithm used, yes?
A That's --
MR. LU: Objection. Vague. Ambiguous.
A That -- that is part of it.
Q Okay. And if you have a poor algorithm, one result of that could be that your access points are calculated quite close to the location of the scanning vehicle as opposed to closer to the actual point of the access point?
MR. LU: Same objection. Foundation.
A Right. So, I mean, it's -- it's a function of the collection process as well as the algorithm.

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Q Okay. And that -- and that if there is, the accuracy of the calculated location information is a function of both the scanning methodology and the algorithm used?
A Correct.
Q The -- the question I asked about designing around Claim 1 of the 694 patent by avoiding the arterial bias question, I'll ask you the same question in the context of the 988 patent. I'm a competitor and I want to design around Claim 1 of the 988. In particular, I want to not meet the avoid arterial bias limitation and I want to practice the rest of the claim. Can I do that?
MR. LU: Objection. Vague. Ambiguous. Also object to the extent it calls for speculation, and asked and answered.
A Yeah, I think the fundamentals are the same as the 6 -- as in the 694 patent so, you know, as I said there, I -- I -- I find it difficult to think of a way that one could achieve the reference symmetry without also avoiding arterial bias. Then in the follow-up question we imagined a situation where that might happen, but then you would end up with poor accuracy.
Q Okay. In order to determine whether a given data set has arterial bias within the meaning of the 988

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and 694 patent, do you have to determine what constitutes an artery as opposed to any other street?
A Well, you know, I -- I had that impression to some extent when I was reading the -- their definition or their examples of arterial bias and, you know, my impression was that they -- they were defining arterial bias in the context of the -- in the random model where the data collection -- the points that you collect occur from tracking randomly driving vehicles which tend to spend more time on arteries and that in a way -- in a way that defines arteries. I guess to come back to your question, in order to determine whether there's arterial bias does one need to determine -- you know, know where the arteries are?
Q Right.
A I think you would.
Q And does the patent give us any -- any information that would help us draw the line between what constitutes an artery and what doesn't constitute an artery?
A I vaguely remember something about the, you know, heavily trafficked routes or something to that effect. I don't remember exactly. So, for example, column 8, line 8 of the 988 patent.
Q Yes. So starting at line 4 of column 8 the 988

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patent says, as a result, over time the random driving covers more and more ground by the cumulative coverage shows a bias to the main roads, comma, or arteries at the expense of the smaller and surrounding roads.
A Right. So that's -- that's one definition of artery.
Q The next sentence after -- after what I read in Figure 3, arteries 304 and 305 are heavily traversed by the scanning vehicles resulting in a heavy amount of scanning data for those streets.
A But the next sentence, at streets 306 and 307 are rarely, if ever, covered because there is no frequent destination of those streets and the arteries are more optimal travel roads.
Q Okay. So that, in your view, gives us at least some information to start with?
A Some.
Q Okay. So, again, my question goes -- goes back to, where do we -- how do we actually draw the line between what constitutes an artery and what constitutes a road that is not an artery?
MR. LU: Objection. Vague. Ambiguous.
A I'm not sure that you can draw the -- a hard line in this case, and I'm not sure one needs to in this patent or -- because the idea is to come -- you know,

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is to -- the invention describes a way of covering the -- all of the streets to avoid in general this -- this form of bias that would happen if you didn't cover all the streets.
Q Is avoid a synonym for eliminate in your mind?
A Did you say is avoid a synonym for eliminate?
Q Yes.
A No. I think I actually addressed that point.
Q Is reduce a synonym for avoid?
A Well, in this context I think that's what avoid means. I think I said as much.
Q What's your basis for the contention that to avoid arterial bias is to reduce arterial bias?
A Well, I have some points in my declaration. So, for example, I mean, drawing on the specification itself in my paragraph 122, they use the word reduced in the specification, and for also example Figures 3 and 4 my paragraphs 123 and 124 show an example where the arterial bias is reduced but not necessarily eliminated.
Q Which one of those shows an example where it's reduced but not necessarily eliminated?
A Well, Figure 4 is showing -- is showing that the calculated locations are closer to the correct location than in Figure 3. Figure 3, as captioned, is

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an example of arterial bias.
Q And is it your view that Figure 4 shows calculated locations for the access points with reduced arterial bias but still some arterial bias?
A Yes.
Q Okay. Can you tell me why you think that there is some arterial bias shown in Figure 4?
A Well, the -- the degree to which you can reduce arterial bias depends on a lot of factors, as I said in the declaration, and including the ability -- the distribution of roads and the distribution of access points and the strength of your antennas and so forth. And on reflection it might be difficult to tell simply by looking at Figure 4 that there is still some arterial bias as opposed to simply inaccurate location calculations, but I was thinking that -- I was thinking that in general you would still have some bias toward the arteries. I have to admit I'm having difficulty reconciling why that is because there's so many factors involved in the degree of arterial bias.
Q Do -- does Figure 4 show arteries?
A It doesn't label any arteries. The Figure 3 -- assuming that Figure 4 is meant to be the same city as Figure 3, Figure 3 labels the arteries and streets and so I guess by implication the same roads would be

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arteries and streets in Figure 4.
Q If -- if -- you're right that it doesn't say that, but let's assume that that's true for the moment and that in that situation, given the assumption that the arteries identified in Figure 3 should be deemed to be arteries in Figure 4, in that case does Figure 4 show arterial bias?
A No, I guess it doesn't.
Q In -- well, strike that.
By how much does arterial bias have to be reduced in order to be avoided within the meaning of the 988 and 694 patents?
A I'm not sure one can quantify or -- I'm not sure one can quantify the degree to which it is reduced or needs to be reduced. I think that it's an imprecise term. The patent may not need that level of precision in the context of this claim. The goal is to collect the data and construct a database in a way that the calculated positions will reduce arterial bias and perform the invention, then you will -- it will result in reduced arterial bias.
Q And so I understand your last answer, when you say perform the invention, what exactly do you mean by that?
A I would mean collecting the scanning data using

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some kind of a planned route that covers all of the streets or substantially all the streets so that you can obtain a better sample of the access point and locations.
Q As you mentioned a moment ago, you have identified some factors in your declaration that relate to the degree by which arterial bias might be avoided or reduced in your view of that term, and that's what we see at paragraph 125, right?
A Right.
Q Could the capabilities of the scanning device -- just to take one of the examples you give, could the capabilities of the scanning device be so limited that even when you collect the scan data using a planned route that covers substantially all -- all streets in the area, could the capabilities of the scanning device be so bad that you would, in fact, have arterial bias?
MR. LU: Objection. Vague and ambiguous. Foundation. Calls for speculation.
A I think if you used the same scanning device for all of your scanning and it had bad qualities you didn't -- you weren't precise about, let's assume we're talking about a weaker antenna, then if you're using that same device on the arteries as well as on

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the back streets, for example, I'm not sure how that would change the effects of arterial bias significantly. Right.
Q Could the number of roads in the target area, another factor you identify, or the distribution of roads, another factor that you identify, could either of those factors be so significant that arterial bias couldn't be avoided?
MR. LU: Objection. Vague.
A Yes. I'm thinking of the smaller towns where I live that have very sparse roads, and so if you can only drive on one side in effect within the radio range con -- of the antenna, if you can only drive on one side of the buildings, then all of your observations will be on one side, it would be difficult to avoid bias toward those roads.
Q And in the sort of small town limited number of road situation you've described, would that also have an effect on reference symmetry?
A Yes.
MR. LU: Take a short break?
MS. MANNING: Let me ask one more question.
MR. LU: Sure thing.

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(09:17:58-09:19:27)
BY MS. MANNING:
Q Looking at the next paragraph, paragraph 126.
A Yes.
Q You give your view that Skyhook's claim construction for avoids arterial bias is as precise as the subject matter of the 988 and 694 patents permits. Could you tell me what you mean by that?
A Well, we touched on this a few minutes ago when you asked about the degree of reduction, and I was saying something to the effect that it would be difficult to quantify the degree of reduction of arterial bias because it is sort of inherently an imprecise term and the patent itself doesn't require one to quantify it, simply to perform the scanning in a way that leads to less arterial bias than you had before. So it doesn't -- it doesn't matter how much or it would be difficult to quantify how much.
Q When you say less than you had before, what do you mean by before?
A Oh, I'm sorry. So less arterial bias with their method than without their method such as were shown in their examples.
Q And arterial bias varies in, for example, the random method, right? I think we established that.
MR. LU: Objection. Vague. Ambiguous.

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A Arterial bias varies in the random method. I'm not sure what you mean.
Q Well, the amount of arterial bias present in, for example, the database that had been compiled through scanning using the random method of traversing the area, the amount of arterial bias for any given access point can vary --
MR. LU: Same objection.
BY MS. MANNING:
Q -- correct?
A Well, for any given access point. So now we're talking about a different situation than the general concept of arterial bias as a whole -- of your data set as a whole, but certainly the random method is -- is going to lead to unpredictable coverage of your area and so some areas will have better coverage than others in terms of the set of streets and the degree to which you're getting observations around an access point. So, yes, some access points will have more bias than others.
MS. MANNING: Why don't we take a break.
MR. LU: Okay.
VIDEOGRAPHER: The time is now 9:20 and we're going off the record.
(Recess taken)

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(09:31:38-09:32:55)
VIDEOGRAPHER: The time is now 9:31 and we're on the record.
BY MS. MANNING:
Q Dr. Kotz, I had a question for you about paragraph 132 of your declaration. You got it?
A Yes.
Q In paragraph 132 you said the Chinese postman routing model may drive some streets more than once, citation. In such cases driving an additional street or two would actually reduce arterial bias, not increase it. Could you explain that last sentence to me? Why would driving an additional street or two actually reduce arterial bias, not increase it in the Chinese postman routing model?
A Yeah, I think I was thinking about if you were driving additional streets that weren't arteries, such as in the figure, then you would have more data points on nonarteries and tend to reduce the effects of arterial bias.
Q When -- when -- and when you said the figure, you were referring to Figure 4 of the 988 patent?
A Yes.
Q So does the statement, again, depend upon the distinction you've been drawing of arteries versus other kinds of streets?

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A Right. In this -- in this context it would.
Q Any other reason why driving the additional street or two would reduce arterial bias?
A I don't think so. Of course, in 133 I would -- I point out that an even better solution would be to simply not count the data from driving streets twice or otherwise compensate for it.
Q Okay. I did note that you have identified a couple of techniques for reducing arterial bias other than -- well, strike that.
The technique of discarding the data for streets driven more than once, is that a way of reducing ar -- strike that again.
The technique you note of discarding data for streets driven more than once, would that be a way of avoiding arterial bias within the meaning of the claims?
MR. LU: Objection. Vague and ambiguous. Foundation.
A No, I don't think it's -- in some ways it's not related to arterial bias. It's -- it's -- it's a bias that results from driving a street more than once, whether it's an artery or not.
Q And regardless of what kind of street it is, you can avoid that problem by getting rid of the data?

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A That would be one way to avoid it.
Q Okay. And that would be outside the claims of the patent?
A Yeah, I don't think -- I don't recall the patent talking about that issue specifically.
Q Okay. And another technique you note here would be in paragraph 133 would be to simply turn off the scanning when driving a street already driven. Would that be a way of avoiding arterial bias within the meaning of the claims?
MR. LU: Same objections.
A No, I don't think it's -- it's a different -- it's an orthogonal concept, orthogonal bias problem.
Q Okay. Are there any other ways that you can think of of reducing the effect of arterial bias?
A Well, in effect, you're asking me to invent new technology on the spot.
Q I am -- I am not. I'm asking you if you -- if you are aware of any. If you are, that's great, I'd ask you to tell us that, and if you're not, you can tell us that too.
A Not off the top of my head, no.
Q The -- the two that you've identified in paragraph 133, those two techniques, discarding data for streets driven more than once or turning off the

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scanner when redriving the street, are those ways of approaching the problem that would have been known to a person of ordinary skill in the art in late 2005?
A I just want to clarify. You say are those ways of approaching which problem?
Q Fair point. Let me ask you a different question. In paragraph 133 they say there are -- there are any one of a number of techniques to reduce the effects of arterial bias and then you give two examples of ways to do that. Other than the two examples that you've identified here, there are no other ways that you can think of to do that, right?
A Right.
Q Okay. So my question is the -- the two examples you do give, were those two examples known to persons of ordinary skill in the art in late 2005, the time the patents were filed?
A I don't know.
Q Dr. Kotz, I've handed you what we have marked as Google Exhibit 1015. It is a copy of U.S. Patent Number 7474897 and it is Bates numbered GSHFED_0000061 through 74. And have you reviewed this document before, sir?
A Yes.
Q And you're aware that the predefined rules

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(09:37:37-09:39:54)
limitation in Step C of Claim 1 is at issue in this case?
A Yes.
Q Sir, once again, I am a competitor and I'd like to practice Claim 1 of 897 except I would like not to infringe it, so I've identified a particular limitation I want to avoid practicing. The particular limitation I want to avoid practicing is in Step C. I would like to, in particular, determine whether an observed access point should be included or excluded from a set of WiFi access points, but I don't want to do it using predefined rules. How would I do that?
MR. LU: Objection. Vague and ambiguous. Incomplete hypothetical. Foundation.
A That would be difficult because even if you decided to, for example, exclude or include an access point based on a flip of a coin or other random method, that itself is a rule --
Q Right.
A -- and presumably predefined. So if there's a way, I don't see it right now.
Q Okay. Is a -- is a rule within the meaning of the 897 patent just any decision-making criteria?
MR. LU: Objection. Vague and ambiguous.
A Well, I mean, I -- I defined it in my declaration

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and so, for example, we used -- there's a citation here to a dictionary and a determinant method for obtaining a certain result, which sounds similar to what you're talking about, but more precise than your definition just now.

Q Okay. And you think this is an accurate definition of the ordinary meaning of the rule that we see here in paragraph 89?

A It's accurate to the extent that we're citing a well-known dictionary. It also seems reasonable to me.

Q Is that the meaning of rule within Claim 1 of 897?

A That seems --

MR. LU: Objection. Vague and ambiguous. Incomplete hypothetical. Do you want to read to him the whole claim limitation rather than selective portions of it?

MS. MANNING: I don't actually. I'm asking about the meaning of the rule.

MR. LU: All right.

BY MS. MANNING:

Q And --

MR. LU: And just to be clear, all this testimony has been about the meaning of rule?

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THE WITNESS: That's my understanding.

MS. MANNING: That is my understanding as well.

MR. LU: Okay. Fair enough.

BY MS. MANNING:

Q So as a predefined rule -- well, strike that. What's a predefined rule?

A Well, I'm trying to remember if I actually opined on that specifically. Yeah. So, for example, I had said in paragraph 94 I understand predefined to refer to something that is determined prior to a specified occurrence.

Q So putting those together, a predefined rule would be something that is determined prior to a specified occurrence, that something being a determinant method for obtaining a certain result, right?

A Yes.

Q Okay. And those are the definitions you gave at paragraphs 94 and 89 of your declaration, Exhibit 1004, right?

A Correct.

Q Is a predefined rule that says I'm going to use every observed WiFi access point to determine the location of user device a predefined rule within the

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(09:42:45-09:44:12)

meaning of the 897 patent?

MR. LU: Objection. Vague and ambiguous.

A Well, I mean, within the meaning of the patent you have to look at the context of the use of the word predefined rule and the context is using the recorded location information as part of -- in the -- in the context of the rule to determine whether you include it or not. So to use every WiFi access point isn't using -- to include every WiFi access point is not using the recorded location information.

Q Why not?

A Because your rule, as you stated it if I heard it correctly, was to use -- simply include every WiFi access point, and that rule doesn't mention literally or implicitly the recorded location information.

Q Well, it would in that my rule is use all of the -- all of the observed access points.

A But your rule isn't determined at all by the location information.

Q So does the -- does the criteria of -- of -- of the predefined rule within the meaning of the claim have to be about the calculated location information?

MR. LU: Objection.

BY MS. MANNING:

Q In other words, does -- does whatever decisional

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(09:44:14-09:45:22)

criteria I'm using have to turn on something about the calculated location information?

MR. LU: Objection. Vague and ambiguous. Compound.

A The rule has to in some part at least refer to the recorded location information. You said calculated, but I'm looking at the claim and it's the recorded location information.

Q Yes.

A And my feeling is that if it didn't refer to that information at all, such as your earlier example, then it's not a predefined rule in this context.

Q When you say refer to, help me understand what you mean by that. In what sense must it refer to the recorded location information?

A So -- so the rule, as we discussed earlier, is a determinant method for obtaining a result. In this case the result you're -- you're trying to obtain is a decision about whether to include or exclude the WiFi access point, and so this determinant method needs to refer to the recorded location information in making its decision.

Q Why?

A Well, that's the way I read the claim. Using the recorded location information in conjunction with

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(09:45:25-09:47:01)

rules to determine whether to include or exclude.
Q You emphasize using in your answer just now.
A Yes.
Q All right. So to use something in conjunction with the predefined rules means that the decisional criteria relies on some -- something about the nature of the calculated location information, is that right?
A It -- it relies on the recorded location information in some way.
Q Why isn't the more natural reading of this just you've got a rule, it's predefined, whatever that rule is, you just apply that rule to the -- to the in or out decision on the calculated -- on using the calculated location information in -- in the set or out of the set?
MR. LU: Objection. Vague and ambiguous.
A I really think you should restate that question because I found it vague also.
Q Okay. Let me -- let me strike that last and I'll ask it a slightly different way.
Why can't you have a predefined rule that will allow you to determine whether to put an observed access point in the set you're going to use for a location or exclude it from that set? Why can't you have such a rule that does not depend on any quality

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(09:47:09-09:48:16)

of the calculated location information?
A So --
MR. LU: Objection. Vague and ambiguous. Foundation.
A So I'm going to correct you again. This is about recorded location information.
Q Yes, I apologize for using the --
A That's fine.
Q -- other term. I do mean -- I do mean them to be synonymous.
A Well, they're not but --
Q Well, that is -- that is an issue but -- but if you can answer with reference to the recorded location information.
A Right. So the -- if you had a rule that did not use the recorded location information in some way in making the decision, then I don't feel that it would fall under the -- this -- this term of the claim.
Q Why not?
A Because to be simple about it, it's simply the way I read it. You have -- the word in conjunction with means that the -- the rules are used in conjunction with this information, and if you have a rule that isn't used in conjunction with that information, then it's not covered by this language.

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Q Why doesn't in conjunction with simply mean that the rule is applied to the various recorded location information as opposed to being -- as opposed to turning on some quality of the recorded location information?
MR. LU: Objection. Vague.
A That's a different distinction than I heard you make before. Sorry. Well, so quality of recorded location information is very vague. I'm not sure what you mean by that.
Q As I understand your testimony, it's that the decisional criteria, the predefined rule, has to relate in some way to some characteristic or quality of the recorded location information, is that -- is that right?
A It has to refer to the location information in some way, and I could imagine thinking mathematically that any function of that information could be used, and if you had a function that defined a characteristic of the location or a quality of the location, whatever -- however you might choose to define those functions because those words themselves are loose, then that would fit, but I wouldn't constrain it to quality or characteristic. Any use of the recorded location information fits.

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(09:50:04-09:52:47)

Q What if my predefined rule was I'm going to use every other recorded location information, every other piece of recorded location information for each WiFi access point -- withdrawn.
Let me try again. Why can't my rule be that I'm going to use the recorded location information for every other observed WiFi access point?
A Well, let's look at this carefully. So it says using the recorded location information for each of the observed WiFi access points. So as I read this rule, it is talking about a particular access point, and you're trying to decide whether it should be included or excluded from the set of access points, and so constraining our thought then to a particular access point, you're going to use the recorded location information for that access point in deciding about that access point, and so then your question is not quite phrased correctly because you talk about every other access point.
Q Why can't my predefined rule be -- strike that. Given your view that the rule must be applied to each owned WiFi access point on an individualized basis, which is what I just heard you testify, given that view, why can't my predefined rule be I'm going to use that access point --

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(09:52:50-09:53:38)

A Because you --
Q -- and, therefore, you would use every access point?
A Because then you didn't use the location information.
Q Again, so the rule has to be something about the ac -- has to turn on some -- something having to do with the information itself -- recorded locations I should say?
A Right.
MR. LU: Objection. Asked and answered.
BY MS. MANNING:
Q Why?
MR. LU: Objection. Asked and answered.
BY MS. MANNING:
Q Is that -- is that -- is that based on anything other than the claim language? Is there something in the specification that supports that or is that just your straight reading of the claim language?
A Well, it is my straight reading of the claim language, but I -- you know, I'd have to go back and look, but I'd be surprised if the specification didn't talk about --
MR. LU: David, if you want to look at the specification, you should.

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(09:53:38-09:55:40)

BY MS. MANNING:
Q Yeah. And Mr. Lu is right. If you want to look at the specification, that's fine. My -- my question was in giving your answer were you basing that on anything other than the -- than your reading of the claims? Were you -- did you have in your mind something about the specification that informed your views or not?
MR. LU: And, David, if you need to look at the specification, you should.
MS. MANNING: Yes.
A Well, I mean, the straight answer is that I did not have in my mind when I answered the question a particular place in the specification, but I'd be surprised if the specification wasn't using the location information because that would be, you know, an obvious part of such a method.
MR. LU: David, again, take your time to review the patent specification. You don't have to answer these questions on the fly.
BY MS. MANNING:
Q If you feel that you need to review it more to answer my question, you're certainly welcome to do that. My question was about what you had in mind as opposed to --

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(09:55:41-09:57:10)

A Right, which is why I eventually answered it.
Q Okay. The recorded location --
MR. LU: David, are you still reviewing the patent specification right now before she moves on?
THE WITNESS: Well --
BY MS. MANNING:
Q Are you done answering the question or are you still considering your answer?
A I'm done.
Q The recorded location information, would that be recorded as a latitude and longitude or do you know?
MR. LU: Objection. Vague and ambiguous. Goes beyond the scope of the witness's expert declaration.
A I didn't -- I -- I wasn't asked to think about that, to opine about recorded -- what location means. I didn't say anything about that in my declaration. I hadn't really thought about it.
Q Okay. So do you know one way or the other?
A I don't recall.
Q Assuming -- assume with me that the recorded location information is recorded as a latitude and a longitude. Could a predefined rule be to use only those latitudes that end with an even number?

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(09:57:17-09:58:29)

MR. LU: Objection. Vague. Which -- which -- which -- which -- which digit are you talking about in terms of a latitude and longitude?
MS. MANNING: The final digit ends with.
MR. LU: Okay.
A Well --
Q And I think I said use the -- use the -- I meant use the recorded location information that has a latitude that ends with an even number.
MR. LU: Objection. Foundation.
A So be pedantic for a moment. Latitude and longitude are real numbers, but when they're measured, one has a certain degree of precision and so there is a last digit. And so let's assume for the moment that location is measured by latitude and longitude up to a certain precision and that there's a last digit and one can easily determine whether it's even or not. So a rule that made a -- made its decision based simply on that would be using the recorded location information in a rather silly way.
Q But it would? That would be a predefined rule within the meaning of the claim?
A I think so.
Q Okay. What -- what's an algorithm?

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(09:58:59-10:00:39)
A Let's see. I don't remember if I defined it in my declaration.
Q You're welcome to review your declaration. If you did, I didn't note it.
A Yeah, I don't think I did, and I don't recall that that was a term that was in contest, is it?
Q It is -- it is a term that you use in your declaration, the word algorithm appears in there?
A Yes. Right. Right.
Q And I wanted to understand, you know, what it is you meant by it.
A Okay. I just didn't want to accidentally on the fly construe a term that was in contest so -- so I guess an algorithm would be a -- and, again, this is an on-the-fly definition, but it would be a determinant method of accomplishing some task. I'm sure I could, you know, define it better, but that's quick.
Q That's quite similar to your definition in paragraph 89 of a rule, a rule being simply a determinant method for obtaining a certain result?
A Right, which is why I thought of it. Another good definition -- reasonable definition of an algorithm would be a series of steps to accomplish some calculation or task.

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(10:00:46-10:02:53)
Q One definition that I found was in mathematics and computer science an algorithm is an effective method expressed as a finite list of well-defined instructions for calculating a function. Would that seem like a reasonable definition for you?
MR. LU: Objection. Vague and ambiguous. Also objection to the extent it calls for a legal conclusion.
A Well, from a computer scientist's point of view as opposed to a lawyer's point of view, it's a reasonable definition.
Q To -- to give an analogy to someone who, unlike yourself, is not a computer scientist, would it be fair to analogize an algorithm to something like the steps of a recipe, would that be a fair analogy?
A That's a common analogy, yes.
Q Okay. If you gave one of your graduate students the assignment of -- of stating for you an algorithm for determining a weighted centroid position for all position information reported for an access point and your student gave you the specification of the 988 patent, would you say that your student had in fact given you that algorithm?
MR. LU: Objection. Vague. Ambiguous. Foundation.

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(10:02:54-10:05:00)
A Well, first of all, I would expect any student to be able to simply write down that algorithm without having to look at the 988 patent. Weighted centroid is a fairly routine algorithm. Also the patent, of course, provides a lot more in it than the weighted centroid. I don't recall whether it provides a specific algorithm or description of that algorithm. On the other hand, I don't think it would need to.
Q Why not?
A Because, as I said, any graduate student worth their salt would be able to do that in their sleep or undergraduate for that matter.
Q What do you understand the term logic in the claims of the 988 patent to refer to?
A Well, so let's see. I have quite a lot of opinions related to that term. In the -- in the context of these patents we're talking about computer implementing logic, and so I take the word logic to refer to computer hardware/software.
Q Is that an either/or, computer hardware or software?
A Yes.
MR. LU: I'm sorry. That was vague and ambiguous. Are you saying either A or B but not both A or B or it can be A, it can be B, or

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(10:05:04-10:06:18)
it can be A and B?
MS. MANNING: Let me clarify that for you.
MR. LU: Just so you know, the reason why I raise that is I spent quite a bit of time litigating over that particular issue as to what or -- what or meant.
THE WITNESS: In computer science that would be an exclusive or.
MR. LU: That's correct.
BY MS. MANNING:
Q Do you mean it as an exclusive or, it's either one or the other but not both?
A No, I would include both certainly, yes.
Q Okay. So -- so your view is that logic could be computer hardware, it could be computer software, or it could be both computer hardware and software together?
A Yes.
Q And what's your view based on?
A Common use of the term in -- in -- at least in my field.
Q With respect to the -- well, actually, why don't you take the 988 patent. I'm going to ask you a specific question about it. Could you look at column 12, there's a passage from line 29 to roughly line 38.

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Do you see that?
A Once the parsing process?
Q Yes.
A Once the parsing process.
Q There is a reference on line 34 -- I'm sorry, 33 and 34 of column 12 in the 988 patent, there's a reference there to new access points being added to the database?
A Right.
Q And would you agree with me that -- that that tells you what to do, not how to -- how to actually add them to the database?
MR. LU: Objection. Vague and ambiguous.
A True.
Q And in Claim 1, the limitation refers to logic to add records to the database for newly discovered WiFi access points. Would you agree with me that the records referenced there have to have both identification information for the access point and calculated location information for the access point, that's -- that's the record that's actually being added?
MR. LU: Could you read that question back?
(Pending question read back)

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(10:08:40-10:10:55)
A So I'm -- oh, here we go. Well, it's not immediately clear from the claim, but I think so.
Q The claim does refer to each record including identification information for a corresponding WiFi access point and calculated position information?
A Oh, you mean earlier in the claim?
Q Yes.
A Yeah, okay. I was just looking at that clause. Sorry. Right. Okay. So I see that.
Q So given that -- that requirement further up in the claim, would you agree with me that the logic to add records to the database for newly discovered WiFi access points has to be -- has to be adding records that actually have the -- the identification information and the calculated location information?
A I would think so, yeah.
Q So would you agree with me that that logic has to do more than just generically save?
MR. LU: Objection. Vague. Ambiguous.
A Well, you know, the -- the claim term itself says -- goes on to say that said computer logic, including logic to recalculate position information, etc. So it's not simply adding it, it's explicitly doing some recalculation as well.
Q Okay. Okay. So I gather that's a -- that's a

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(10:10:58-10:12:42)
yes. It has to do more than just generically save information to the database?
A Correct.
Q It has to do some work with the actual data before it's saved?
A Yes.
Q The sort of further limitation that you just referenced where it starts said computer logic including logic to recalculate position information, goes on from there, at column 12, lines 33 and 34, do you see there's a number 2 that says, and 2) existing access points are repositioned based on any new data recorded by the scanners?
A Yes.
Q Do you see that? That part of the specification there, that tells a person of ordinary skill in the art what they should do?
A Yes.
Q But not -- yes?
A Yes.
Q And would you agree with me that it doesn't tell them how to do it?
A Not in that sentence, no.
Q Is there -- is there any place else in the -- in the patent that you think tells a person of -- of

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(10:12:46-10:15:30)
skill in the art specifically how to accomplish recalculating position information for WiFi access points previously stored in the database to utilize position information for the newly discovered readings of the previously stored WiFi access points?
MR. LU: David, you should certainly refer to anything you need to refer to when answering that question.
A Yeah. I'm studying the specification to see if I can find it. Let's see if I have it somewhere else in here.
So in that same paragraph, which is about the reverse triangulation model for processing the new data, it talks about the algorithm which factors in the number of records and the associated signal strengths and how it weights stronger signal readings more than weaker signals with a quasi weighted average model, and so the question was about how to recalculate position information for access points previously stored.
Q Yes.
A So my understanding would be that this -- these sentences here and some of the sentences prior to that paragraph are helping you understand those calculations. That's using this reverse triangulation

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(10:15:35-10:17:24)

algorithm it's going to factor in number of records, signal strengths, it's going to be weighting those readings according to the signal strengths, and so I think there's -- you know -- and also the age of the records. So they're using all this information to calculate the location information or the estimated location. I think you would do the recalculation in the same way.

Q Okay. And just for the record, you were referring to the paragraph at column 12, lines 29 through roughly 38?

A Yes. And the paragraph before that, lines 25 through 29 I guess.

Q Okay. It's your view that the -- the reverse triangulation algorithm is the -- is the algorithm that accomplishes that. Would you agree that the specification doesn't tell you what that algorithm actually is?

MR. LU: Objection. Vague. Ambiguous.

A Well, let's see. I mean, it -- it doesn't -- it doesn't spell out the algorithm in detail, but it does provide -- I don't think it would need to. I mean, it provides some of the mathematics that are part of the reverse triangulation model and it provides the factors that the algorithm uses, the number of

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(10:17:28-10:18:46)

records, the signal strengths, the age of the records, etc., but my understanding is that one need not spell out an algorithm in detail in order to teach it sufficiently as long as one of ordinary skill in the art can construct an algorithm that accomplishes what's said in the claim.

Q Right. That's -- that's -- that's your understanding of the legal requirement?

A Right. Right.

Q Right. So my -- my question's about whether it -- whether the -- whether the patent actually discloses the al -- regardless of your view about whether it needs to or not.

A Okay. Okay.

Q The question was does it disclose the algorithm?

A Not in detail, but there's a lot of information about the -- that is needed to understand their embodiment of an algorithm that would do that.

Q Let me ask you about a limitation in Claim 2 of the 988 patent. You see that refers to logic to identify position information based on error prone GPS information?

A Yeah.

Q My first question is, what is error prone GPS information in your understanding?

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(10:18:49-10:20:33)

A Well, it would be a GPS reading that has some error relative to your actual location.

Q Is it -- is it -- is -- is the phrase error prone -- prone GPS information, is that some commentary on the typical quality of GPS information or is it specific to I have a GPS -- I have this GPS reading and it appears to be erroneous?

A I see. Let's see the context here. I think -- GPS is -- information is typically erroneous, it's not perfect, and GPS devices are known to occasionally have large errors. I think in the context of this claim they're talking about this clustering logic and the purpose, as I recall from the specification, is that the clustering logic is enabling you to decide which readings are substantially erroneous and should be excluded.

Q Okay. And clustering logic --

MR. LU: We've reached seven hours so if you can finish up.

MS. MANNING: Let me just tell you what I'm hoping to do. I have, I think, a couple more -- a couple more questions. If we could take a quick break, make sure there's nothing else of great significance and we can figure out if we're done or if I need a couple of

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(10:20:35-10:29:10)

questions.

MR. LU: Okay. And I may have one or two follow-up questions. So let's take a short break.

VIDEOGRAPHER: The time is now 10:20 and we're going off the record.

(Recess taken)

VIDEOGRAPHER: The time is now 10:28 and we're on the record.

A So I wanted to start with a clarification about what we were just discussing with respect to the algorithm in the 988 patent.

Q Sure.

A And so, you know, I -- I had some time to look at it a little more closely, and these mathematical equations close to the paragraphs we were looking at before lines 50 through 64, for example, are part of a -- it actually calls it this, applying the algorithm. So this is the algorithm for triangulating the position of an access point using latitude and longitude. It goes on. I mean, there's more detail on the next column as well. And it describes it in a sequence of steps so, for example, column 13, line 26 or 7 there's a paragraph, this final lat long is then used as the final centroid value for the location of

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(10:29:14-10:31:26)

that access point. So these two columns together at least provide, like I said before, sufficient detail, I think, for one to construct an implementation of an algorithm for calculating or recalculating the positions of access points.

Q Since you've directed our attention to them, I do have a question for you about them. In all cases it refers to a lat subscript U and long subscript U, both equations. I should probably say sets of equations refer to that. In the text it says, if the corresponding recorded GPS location of access point I is denoted by lat I long I, what's the relationship between lat I long I and lat U long U?

A So lat U, for example, is calculated using this equation from a combination of all the lat I values, and from the looks of it there are N, N as in Nancy, lat I values that are being computed together to produce lat U and, similarly, long U. And so the -- the U subscript refers to the result and the I subscript refers to the inputs.

Q In paragraph 70 of your declaration you note that there are many possible ways to divide data points into groups or clusters. Do the claims require clustering by, for example, distance?

MR. LU: Objection. Vague and ambiguous.

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(10:31:32-10:33:03)

A Talking about 988 claims?

Q Yes.

A And specifically Claim 2, clustering logic?

Q Yes.

A No.

Q Would any criteria for putting the data into groups or clusters fall within the scope of that limitation?

MR. LU: And you're talking about the whole limitation? Could you read the limitation, otherwise I object to it being vague and ambiguous.

BY MS. MANNING:

Q In Claim 2 where it recites, clustering logic to identify position location based on error prone GPS information, would any -- any clustering logic that clustered based on any criteria fall within that claim?

MR. LU: Other than error prone GPS information? I just want to make sure the claim -- the question is clear. Objection. Vague and ambiguous.

A I would think so.

Q Okay.

MS. MANNING: I have no further questions for the witness at this time, though I do reserve the right to recross if you direct him.

MR. LU: Fair enough.

E X A M I N A T I O N

BY MR. LU:

Q Dr. Kotz, I'd like you to turn to the 897 patent. And you recall that we had a discussion regarding the meaning of the phrase predefined rules, and during that discussion you were asked whether or not you recollected any portions of the 897 patent specification that disclosed using the locations of recorded WiFi access points in conjunction with the predefined rules. Do you recall that line of questioning?

A Yes.

Q And it was my recollection that you did not immediately recollect any portions of the patent specification. Is that also correct?

A I think so.

Q I would direct your attention to column 10, line 5 of the 897 patent titled Realtime Filtering of Suspect Access Points. Do you see that?

A Yes.

Q If you could read that section and let me know when you're done.

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A Okay.

Q Does rereading that section refresh your recollection as to whether the 897 patent discloses the use of recorded access -- recorded location information for WiFi access points in conjunction with predefined rules?

MS. MANNING: Objection. Leading.

A Well, this -- this paragraph or section certainly does use location information to determine which access points to include in location calculations, yes.

Q Okay.

MR. LU: No further questions.

MS. MANNING: I have no further questions.

VIDEOGRAPHER: The time is now 10:35, and this concludes the video deposition of David Kotz.

THE REPORTER: Same transcript orders as yesterday?

MS. MANNING: Yes, please.

MR. LU: Yes.

(WHEREUPON, the deposition was closed at approximately 10:36 a.m.)

I have carefully read the foregoing deposition and the answers made by me are true.

_____
David Kotz, Ph.D.

STATE OF _____
COUNTY OF _____

At _____ in said County, this _____ day of _____, 2011, personally appeared the above named _____ and made oath that the foregoing answers, subscribed by him, are true. Before me,

_____
Notary Public

My commission expires: _____

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My commission expires February 10, 2015.

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