Functional Requirements

Non-Functional

Question

coming in on a weekly bases, I just want something to call my attention to something I need to look at.

Dr. Gates: And that’s the purpose here.

Dr. Gates: Ok. We’re going to go to data analysis real quick. We have about ten minutes. Are there types of data analysis needed other than trends and predictions of future data? I think we talked a little bit about that. I don’t know if there is anything else to add.

Dr. Pennington: I would say that at least initially we want to keep the analysis pretty simple. I mean I think that one of the uses I see with this is that as we start developing that, you know when we can get, as data starts coming in and we start analyzing how they are in this way, how they are responding across sensors and though time and through space. We can use data properties as a way to call our attention to patterns that are accruing. So we can analyze the data that we collect about anomalies, we can analyze those in a way to help us better understand what we’re seeing. So that sort of analysis I see happing down the road, but I don’t see it in this system right now. Unless something, you develop a different system to do that analysis. I think maybe just trends and the simple things is the place to start.

Dr. Gates: There is one about colors, but I think that’s getting into the design.

Dr. Pennington: colors are important. If I’m looking at precipitation I want it to be blue, it don’t want it to be red, or black. Color is always important.

Dr. Gates: Do you want to be able to download any of the graphs?

Dr. Pennington: Yeah absolutely

Dr. Gates: And you want to display the graphs in real time or near real time?

Dr. Pennington: yeah, I want to be able to look at the graphs at real time, and if I like something I want to be able to download it and print it out, and put it in a publication.

Dr. Gates: What operating system would you like it to run on?

Dr. Pennington: all of them

Dr. Gates: And mobile?

Dr. Pennington: all of them, scientist are like everybody else, we have our favorite tools and we don’t want to switch just to use a particular piece of software.

Dr. Gates: Do you know of other systems that perform similarly to this?

Dr. Pennington: nope, not like this

Dr. Gates: So there are entrepreneurship opportunities?

Dr. Pennington: yes, entrepreneurship opportunities.

Dr. Gates: Other topics that you think are important that you think we need to discuss?

Dr. Pennington: No, not at the moment.

Dr. Gates: I’ll open it up for other questions

Student: Just to clarify, so are we showing/displaying anomalies compared to the data properties, I guess comparing the data properties to the actually data. And to see if there is a spike or anything, and once we have the anomalies, the scientists determine if those anomalies are errors or actual.

Dr. Pennington: yes, absolutely. And so it would be nice when you build this storage, however you store the anomaly information. It might be nice to include in that a way for the scientist to flag it, once they look at it and decide whether it was an error or whether it was not an error. To flag it as what it was. I think that would be important information to collect.

Student: Can you kind of explain again what a foot print is?

Dr. Pennington: let me draw a picture that might be the easiest thing. So I have some sort of instrument here that’s collecting information. So maybe its located right here on this tower, so here is the ground. Now the instrument itself may say that it has a special foot print will call this, lets say this is 1 km. I don’t know what it is, that’s an awful big footprint, well we will leave it. So that’s what it says, then meta-data will say it has a 1km resolution. But maybe what your measuring is. Based on this what it would say is ok this instrument is collecting information, around this area right here, based on what the metadata says. What if there is a strong wind coming [from the left], then all these particles that you’re measuring, are being blown. So essentially what ends up happening is you end up collecting information here [to the right of tower]. Does that make sense, does that help?

Student: Skipping back to the information being able to be shared, how far do you want it to be as far as social? Do you want to have facebook or twitter [integrated into the system], or all in house within that browser and keep all the information inside there?

Dr. Pennington: Well, its an interesting question. Most scientists detest Facebook and Twitter. Primarily because they don’t see a point to it, they don’t want to chit chat with each other. They don’t want to know what you’re doing right now. They’ve got their own problems to deal with, they don’t care what youre doing right now. Unless its’ in the context of the work they’re trying to do. Having said that, if you think of a use case where it would be important for them to have some sort of social networking then it is important to include it. If it’s just so that I can be regularly informed what you’re eating, I don’t want it. So if you were going to put something like that in, I think it would be important to scope it in a way that it directly ties to the work [they’re] trying to get done.

Student: That’s what I meant, the facebook and all those networking sites is just an idea of how social you want to be within that system. If you want to keep it within that system, do you want to have it set up, so that when those scientists share it to each other, all of them see it, and have that kind of hang out and discussion within that browser itself, instead of trying to bring in facebook.

Dr. Pennington: Could be, yeah. I mean, I wouldn’t put it on facebook. But that kind of thing, like if im in the field and something happens, I might want to notify other people in my research group what’s going on. And I might want some discussion about it, yeah.

Student: Does the system have some way to tell, [for example] if the weather adjusted the usual boundaries of the sensor?

Dr. Pennington: The reason this would become important is when I’m designing my properties. I might want to say wind: if the wind is under 10 miles per hour, then I expect this other data to be in this range. On the other hand, if the wind is over 30 miles per hours, then I might expect something different. So its all about articulating what your expectations are in a predefined way. But like I said in most cases we don’t really know what to expect so part of this is going to be using this process to help us understand how things happen.

Student: How would you want the system or users to communicate through our system. For example, if you detect an anomaly, do you want it to throw alerts, send out emails, send out text messages?

Dr. Pennington: I think you need to provide all those possibilities, and let each user specify how they want to be contacted and when, and in what way.

Student: Would you want any of this preliminary analysis available to the general public in some sort of way, or is this all confined to just the scientists.

Dr. Pennington: There is an interesting move towards what they’re calling citizen scientists, where you try to involve people who are non-scientists in your data collection efforts. I can imagine, somewhere down the road, somebody is going to come up with some clever way to involve other people in this process. It could end up being public. Here’s a scenario, maybe I set up sensors down in the plaza in downtown El Paso and I’m measuring something and there’s some sort of anomaly and I want to engage whoever is in the vicinity to go down there and check it out for me.

Dr. Gates: Sounds like a proposal. That’s a good question.

Dr. Pennington: Citizen scientists is a really hot topic because data collection takes a lot of time and effort and if you can get people that are interested in whatever it is that you’re studying, to help you with it then [great].

Dr. Gates: Good questions. Any other questions? So let’s thank our speaker. I want to thank everyone.

Student: I have one last question. I know it said in the project overview that we would be provided with the source code, but as far as the interface, but I was wondering if we would be able to see it, or have someone show us how to use it?

Dr. Pennington: I think that’s [up to] Dr. Gates.

Dr. Gates: I’ve been thinking about that and what I’m worried about is what Dr. Pennington talked about earlier. She really wants it to be science centric. I was going to show you the interface before, but I’m worried that it’s going to take away the creativity. So what I’m going to do is work with Dr. Salamah to provide the information in a more general way that will help you then come up with a new interface and language for presenting it to the scientists. That’s going to be a big part of the analysis that we do. I want to thank everyone.

Dr. Salmah

Dr. Gates: Good questions, I’ll have to think about that one. I think it’s the job of the scientist. If we have a new sensor, to set it up in a way so that they can do comparisons. So I think it’s more their job to set that up, not your job, and not the system’s job. The system’s job should be thinking about cues or thinking about questions to prompt. So the question you asked I think is if you can prompt the user to say, is this calibrated with this [format] or this sensor is recording at a different level than this sensor-- providing information back. That’s my answer, that’s not the scientist’s answer. So I think you should document that question, it’s a good one, and I’ll validate it with the scientist.

Student: When adding new sensors, if the units of measurement don’t match, how are we going to display the sensors? Do we display them as two different units of measurement?

Dr. Gates: Right, we could overlay them on the same graph, that’s for sure, right? Kind of goes back to your question, are we responsible for doing translations and I don’t really think we’re going to do translations with the data. I think that, you can’t do near real time if they’re not the same [time stamps or measurements], but you can inform the user that the units are not the same and then a different part would be doing translations. That’s something that’s added, it’s not what we’re asking to do. The solution would be to do a translation of that data which is done quite often when you take a data set and then you transform it to whatever the time units [you want], because sometimes its Julian days sometimes its Roman and there's differences. If something is all the way to seconds and you only want hours, then you’re going to pull out only on the hours, that’s preprocessing-- it would be more preprocessing. So you would have to provide a warning statement.

Student: So they're going to want, not just the anomalies displayed but also just the regular data displayed?

Dr. Gates: No. I think that if you’re doing monitoring and they want to see it [the results] as data comes in, what it looks like and you're graphing that. They don’t want to see the data itself--it would be on a scaled graph. There’s two things as I understand it, and again this is a question that goes back to the scientist, that you would stream in the data and show it. Now there’s a lot of questions you're going to have to ask about how you’re going to graph it. Are you graphing it by the second, by the minute, by the hour?