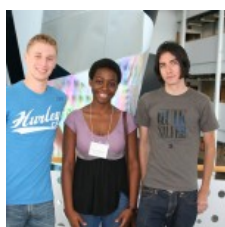


## INVEST

InVest

Faculty: Cinzia Cervato and William Gallus  
Graduate Student: Thomas Parham

Interns: Jordan Borrell, Mandela Magnidjem, CJ Barberan



We seek enthusiastic undergraduate students with a programming background, preferably in Java and/or C++, for an exciting program design, development, and evaluation opportunity in the earth science education domain. Over the past ten years, the Interactive Virtual Earth Science Teaching (InVEST) project has developed two immersive 3-D simulations: a Virtual Tornadoic Storm and a Virtual Volcano. Both have been well received by students. However, the geoscience education community is calling for more rigorous evaluation of the impact these simulations can have on student thinking, as well as a best practices model for further design and implementation of earth system simulations. Potential InVEST research topics include:

- 1.) Updating the Virtual Tornadoic Storm to run smoothly on a 64-bit Windows platform, potentially expanding its capabilities, and comparing its pedagogical impact across desktop PC and "CAVE" environments.
- 2.) Improving and/or re-designing the Virtual Volcano interface to maximize its clarity and ease of use in accordance with the principles of human computer interaction and universal design. Several new interface features have been proposed, but require creative implementation and further study.
- 3.) Developing a graphically rich 2-D volcano model with functionality comparable to the existing 3-D volcano in order to experimentally determine what the third dimension adds to the Virtual Volcano experience in terms of engagement, interaction, and quantifiable learning gains.

In pursuit of these goals, students would have full access to guided-inquiry based teaching materials, user survey instruments, and concept tests developed by the project team. A collaborating volcanologist from Western Washington University has agreed to answer any volcanology questions and verify the accuracy of student-generated content to ensure maximum validity and reliability. Results will be presented at 2011 national meetings of the Geological Society of America and/or American Geophysical Union, as well as published in appropriate journals.

## Last Curtain Call!

Posted on [August 4, 2011](#) by [Jordan](#)

This is probably going to be my last post. Tomorrow is our final day in which we give demos at the symposium, so I will be setting that up most of the day. We have for the most part completed the V-Volcano. The only thing that remains to be fixed is the updated terrain. We still haven't found out how to import the new models into the V-Volcano, but an OSG guy was just hired to tackle that work after we are gone. The good thing is that most of the bugs are gone within the system, so it doesn't crash anymore. This will be good for the demo.

Overall, the REU program was great. I really enjoyed the C++, Maya Modeling, and OSG animation courses. I could have probably done without the Ethics course since I just took that course last semester. I would like to

thanks all of the instructors of the courses for taking time out of your schedule to teach us about modeling, HCI, how to read a paper, etc. Also, thank you Ted and Marie for giving us feedback for our papers, posters, and projects; also, thanks for making the extracurricular activities really fun. They were a nice breather from a long days work.

I would also like to thank Tom, our grad-mentor, for being an awesome mentor. You were very supportive throughout the program, and I thank you for that.

I liked the fact that the REU program was interdisciplinary. It was great to meet a variety of people from different educational backgrounds and learn how to work with them. The extracurricular activities were also a strong point. Being able to interact with my fellow interns in fun activities was a lot better than sitting in a lab doing nothing for ten weeks.

I would have liked more interaction with my PI faculty mentors though. It would have been nice for them to stop by occasionally to say hello and see how things are going. I understand they are busy, but a little interaction other than one time lunch would have been nice.

Like I said, this has been an awesome experience. I can't believe the summer is over; it seems like I just got here last week. I've met some great people, and I hope to keep in touch with them. Since I really enjoyed my time here, I will gladly recommend this REU program.

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## Things

Posted on [August 4, 2011](#) by [Dela](#)

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There are a lot of things I liked about the program, such as the fact that had extracurricular activities to reduce our stress levels. I also loved learning about emerging technologies that I would have never heard of or believed in outside of the program. The main thing I would change is the structure of the classes we took in the beginning of the program.

So this is our last week here. It's intense, and the V-Volcano is doing what it wants to do, and I am not always in agreement with it. I have until 2pm today to fix it, so bye!

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## The Finishing Touches

Posted on [August 3, 2011](#) by [Jordan](#)

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Today, for the V-Volcano, we are putting everything together. Basically, we are putting everything we did on one computer in order to make one final program. Hopefully, this can be completed by the end of the day; I'm confident that it will be though.

There are only a few days left before we pack up for home. It's kind of sad to see this all end, but I am excited to go home for a while. I will miss everyone here, and I hope to keep in contact with them, so if anyone wants to keep in contact with me I am on facebook.

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## BACK FROM "THE FURTHER"

Posted on [July 29, 2011](#) by [Dela](#)

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No, I actually wasn't in "the further" as defined by the movie "Insidious", but i was in a place where I lost contact with the human world as we know it, a place called "the lab". I told my family that I may not return from "the lab" for a couple of weeks, except for the times when I absolutely had to sleep, and when I had to participate in social and academic rituals for my mental and spiritual sanity. Some rituals in which I partook were paintballing, canoeing, scavenger hunting, and talent showing, all of which put my life at high risks of injury. On Tuesday and Thursday the other "lab travelers" and I listened to the teachings of those who answered all of our questions concerning graduate school. On Wednesday we went to Des moines to visit "The Principal" (financial group) and the science center in which we looked into the eyes of the plastinates.

At the end of these activities, I dived back deeper and deeper into "the lab" in quest for answers. I searched for solutions to that which has been haunting me and driving me closer to insanity everyday. Unfortunately my efforts have yet to be rewarded, but I have made equally important discoveries along the way, alongside my team members. We have solved the mystery of the way-point crashes, and I have found a few puzzle pieces. However the most challenging piece of the puzzle has yet to be found, and to find it I will have to master the implementation of the mouse listeners in order to transform ordinary text panels into clickable hyperlinks. If anyone has any clue that will bring me to the light an help me escape from "the lab", please, please, tell me. It may seem at first as if I am not listening, but I can hear you in my subconscious.

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## An Inner-Body Experience

Posted on [July 28, 2011](#) by [Jordan](#)

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Good news, the waypoints have been fixed on the V-Volcano. The program used to crash everytime you used the waypoints, but not any more.

Yesterday, we went to Des Moines for a field trip. In the morning, we visited Principal Insurance company to visit their user study lab. I expected a little more than they showed us, but it was an eye opener to see how little companies invest in user studies. In the afternoon, we visited the Science Center. The Science Center was pretty cool. We got to see the Imax projection screen, behind the dome theater, and the reels of the movies. We also got to see the Body World display of the real bodies that have been plastisized so that you can see the inside of the body. I've read and seen pictures about this, but I never thought I'd be able to see it. It was pretty amazing.

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## Grad-School?

Posted on [July 26, 2011](#) by [Jordan](#)

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Today in our lecture luncheon, Thelma Harding spoke to us about graduate college. I'm pretty sure I'll be going to grad school, so it was nice to have an informational setting about it. I think the biggest pain will be taking the GRE. I was hoping to be done with tests like those when I took the ACT, but unfortunately not.

Last night, we watching the movie Insidious. It's a paranormal horror movie that in my opinion is one of the better scary movies to come out in a long time. It has a great plot and introduces the scary "boo" moments at the right time.

As for the V-Volcano, everything is the same, so nothing new to report. On a side note, I was pretty excited to see my name as a co-author of Tom's paper on the V-Volcano that he's going to present at a conference in October. I hope we can create another paper out of the one the InVest team is writing for the REU program. We will get one out of the user study that is performed after we leave, but I would also like to get one out of the changes we have on the V-Volcano. The only problem is that it's only an informative paper, so we'll see what happens.

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## Surviving A War

Posted on [July 25, 2011](#) by [Jordan](#)

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This weekend was a lot of fun!! On Saturday, we went paintballing! Todd and I dressed for the occasion by dressing as GI-Joe soldiers. We created armor out of aluminum cake pans and duck tape; it was pretty epic! The battle itself went pretty well; Shane and Vlad, Robo-Team's grad-mentors, joined us, so that was a lot of fun to have them there. I think everyone enjoyed shooting at eachother; this allowed them to vent some steam built up over the summer. The rest of the weekend we watched several movies since we were all wiped from paintballing. It was nice to relax after the epic battle. On Sunday, Todd and I went to the mall and had an interesting time, but it was fun nonetheless.

This morning, the InVest team was involved in a user study for the ISP team. I'm not allowed to talk about it in detail since the other teams haven't done the study yet, so I'll keep it brief. I hope we didn't skew the results too bad since the InVest team has a more aggressive way of conducting teamwork, so sorry if we did ISP team. I was told the way we talked to eachother was pretty entertaining, so you are welcome for that entertainment.

As for the V-Volcano, I am fully on the research paper now. I have pretty much every section written up, so now I just have to make it flow nicely and add figures/pictures. We will also be receiving poster feedback tomorrow night, so hopefully all goes well for the poster.

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## Friends In Reverse! Boop, boop, boop.....

Posted on [July 22, 2011](#) by [Jordan](#)

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Last night, we went on a video scavenger hunt for our extracurricular activity. My team consisted of Todd, Daniel, and myself. We were given a series of tasks to do on and off campus and video tape us doing them. This turned out to be a lot more fun than I expected it to be. The night involved us singing the Oscar Meyer Weiner song in front of the meat counter, jogging with a random guy, conducting a wrestling interview in front of a confused gas station clerk, group hugging a Wal-Mart greeter, and several more exciting things.

Tomorrow, we are going paintballing. I am really excited about this since I haven't been paintballing in a while. In a way, I hope that it starts to rain on us so that it will make it more fun. My partner in crime, Todd, and I have a surprise put together for the event, so it should be a lot of fun.

The research paper is coming along for the V-Volcano. This morning I was in the zone and read several papers that I am going to use as references. Luckily, most of the paper is complete since we already had to write chunks of it throughout the summer. I just have to smooth everything out and make the paper flow nicely.

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## Midweek Report

Posted on [July 20, 2011](#) by [Jordan](#)

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We are slowly progressing with updates on the V-Volcano. I've pretty much rapped up the modeling for the Mount St. Helens model. I am now starting on the Piton de la Fournaise model. The models will be limited when compared to the mount st helens model since more is known about the Helens model. Our poster is coming together nicely! Everything is pretty much written into the poster except for the conclusion. Today, I'm starting to piece together the research paper. It's not due until next Friday, but I thought I would get a head start on it.

Other than that, everything has been going great! Everyone is starting to conduct their user studies, so I will be participating in a few for the next couple of weeks. Unfortunately, this weekend my old x-country team is having our annual reunion, and I won't be able to attend. This is a little of a bummer since I haven't seen any of them all summer. The good thing is that we're going paintballing this weekend, and Todd and I have a little surprise made up.

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## Tardy Blog

Posted on [July 19, 2011](#) by [Dela](#)

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Yesterday was a regular hot day. We stayed in the lab all the day, except for when we went to lunch. I am still working on the GUI. It doesn't want to do what I tell it to do, and I'm not giving up. No machine will get the best of me! On a more gentle note, I spoke with my family and friends in Memphis during the entire evening. I had a very good laugh. OK. Bye bye.

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