



# Computer Science Department Student News

Autumn 08

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## Autumn Semester 08

The Computer Science Department would like to welcome back all our returning students and wish all new Computer Science majors a great first semester. We are happy to see so many of you involved in internships this semester. Internships are an important facet of your education and we encourage all our majors to participate in at least one during your academic career. To receive e-mails about new internships sign up for our internship Listserv here: [Student Employment & Internships](#) or visit the Computer Science Department web site and look under Resources on the home page. We are also happy to see so many of you involved in the Computer Science Club meetings that we have been holding on Thursdays, at 6 pm. To inquire about these meeting please contact the Computer Science Club President: Michael Culp [michael.culp@grizmail.umt.edu](mailto:michael.culp@grizmail.umt.edu) or Vice President of the CS Club Peter Wolf at [peter.wolf@grizmail.umt.edu](mailto:peter.wolf@grizmail.umt.edu).



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## Mr. Hand

Brian Hand is a new Graduate Student to the Computer Science Department. Brian is a Missoula native having graduated from Big Sky High School where he was involved in football and basketball. Brian is 28 years old and received a Bachelor's degree in Physics and Astronomy, with a minor in Creative Writing from UM.



*Brian, when did you first get interested in computers?*

**Brian:** I was exposed to computers in grade school. I used it mainly to play games like Carmen Sandiego and Oregon Trail. I also love to write so I used it as a word processor.

*Why did you choose physics to major in for your Bachelor's degree?*

**Brian:** I chose the hardest degree I could find as a challenge to myself. Originally I chose physics and astronomy and then added math, English, and creative writing.

*Were you interested in physics in high school?*

**Brian:** I did have a good physics teacher in high school. I really liked physics and decided to pursue that in college. At one point I really didn't understand the concepts too well. It was intimidating when I first started and then it all sort of came together for me. It seemed like in high school everything was made to be at a level where everyone can pass. College is a lot different. I didn't have any idea what a career was when I was in high school.

*Brian, I always see you are carrying a basketball. Was being an athlete something you considered doing while here at UM?*

**Brian:** Originally I wanted to be a basketball player but because I had straight A's my teachers encouraged me more towards academics. I am still interested in basketball and lifting weights. I work out three or four times a week for an about two hours at a time.

*Brian you mentioned astronomy before is that something you are really interested in?*

**Brian:** I am really interested in astronomy it is the most fascinating part of physics. Relativity is not a mainstream part of physics it is a more imaginative part of physics. Time, space, and velocity are really interesting. It is fascinating that it is possible to contemplate sitting on the edge of a black hole and think about how it could be like a time machine. Something like String Theory is hard to prove but interesting to think about.

*Why a minor in Creative Writing?*

**Brian:** I really enjoyed getting a minor in creative writing. I write about everything. I have stories in process right now on everything from murder to history. A lot of people don't know that much about history. I wrote a short story about World War II that I really enjoyed doing. Right now I don't have as much time as I would like to write. It is sort of on the back burner until I can



Find out more about Dr Johnson by clicking on his picture or visit the CS Website



find more time. I am still reading about a novel a week though.

*Tell us what you are doing now.*

Right now I am focusing on writing my thesis for Computer Science. I am glad I have the experience of writing to help me through it. My thesis is going to focus on my work with Dr Johnson concerning sea level changes. I am working with the program GLIMMER doing ice sheet modeling. We are working on creating simulations that will show potential changes over the next 100 years. GLIMMER is a three-dimensional ice sheet model, designed to be used with a range of global climate models. Ultimately we are trying to improve Glimmer for the end user. We are working on data from the Amundsen Sea Embayment of West Antarctica. Ice shelves in the Amundsen Sea embayment of West Antarctica have thinned and retreated. We are looking at the contribution to sea level changes and how you can analyze that in Glimmer. The data we have comes from ice cores extracted from places in Antarctica like Vostok. It is similar to carbon dating in that they look at the concentrations of oxygen to analyze how old the ice layers are. We look at 125,000 year cycles. We are using Vostok ice core data through four glacial periods with specific parameters to start a foundation for people to build upon. We put in data for the past and run it until we get out correct data for the present observational data. It is an inverse problem. I am working on something called "spin-up". We can tell a lot about a glacier from the outside but we need to be able to tell what is going on from the inside (internal temperature). We can use radar shot down from an airplane and bounce it back from inside the glacier to get data. Basically we want to find out where there is liquid water in the ice to determine how quickly it will melt into the sea.

*What will you do when you finish your Master's degree?*

**Brian:** When I finish my Master's degree in CS, I may apply to the Montana Ecology of Infectious Disease PhD program and perhaps get a PhD in Mathematics. Graduate School is like training to get a full time job. I am trying to acquire as many skills as possible. I am still trying to figure out what I want out of life. The worst thing I can think of is to be stuck in some dead end job with no challenges.

*What do you find interesting about computer science?*

**Brian:** I am interested in the convergence of computers and science. I am really looking forward to an interesting career. I have a strong work ethic. I am really hoping that a career in computer science will provide me with that. I would really like to make an impact. That is why I like to know as much as I can about different things. It is fascinating to think there are no limits.

*Tell us about the research you did this summer for Dr Henry.*

**Brian:** This summer we worked on creating a system of computers that would function as a single unit. It is a wall of monitors that project one picture. One computer controls four monitors. There are 16 windows with a window manager that stretch the picture across all the screens. It is a technical challenge to set up that many monitors and work stations to work together. They have four times as much processing power. With the extra computing power they should run better than the average system. It is possible we will use the wall to showcase different research projects the department is working on to show to the public.

## Mr. Hagedal



Matt worked this summer for Dr Joel Henry creating the wall of monitors to the right. To find out more about Joel click the picture above or visit the CS website.



Matt Hagedal is currently a Computer Science undergraduate student. Matt is a past Touch America CS Scholarship winner and participated in a project with Dr Morton last summer in Fairbanks Alaska at the Alaska's Arctic Region Supercomputing Center. Matt worked during the summer semester on a project with Dr Joel Henry and is an undergraduate researcher for Yolanda Reimer during fall semester.

*Matt are you from Missoula?*

**Matt:** No, I came here from Chicago four years ago. I have relatives here my Aunt and Uncle. When I first came here, I thought wow! I didn't know this kind of place existed. It was my size and my speed. Then I learned about the university and decided this was the place for me.

*Do you miss Chicago?*

**Matt:** I don't miss a whole lot about Chicago, only the people (my parents and friends). I grew up in the suburbs of Chicago so it wasn't really rough there, but there are so many people it makes anything outside of the house tough to do. It is really a hassle to get around.

*Is the weather similar to Missoula in Chicago?*

**Matt:** The temperatures here are similar to Chicago, but Chicago is really humid. They have huge budgets so in the winter they have better snow plow services. Here they just assume you have studded snow tires.

*What do you like about Missoula?*

*Matt is an Undergraduate Researcher for Dr Yolanda Reimer*

*To find out more about Yolanda click the picture below, or see our website for more information.*



**Matt:** Missoula has the right amount of everything. In ten minutes you can be out tromping through the woods. If I wanted to experience that in Chicago I would have to go all the way to Wisconsin.

*Why are you majoring in computer science?*

**Matt:** In high school I was interested in physics and chemistry. Initially I wanted to be a physicist or a chemical engineer, but I decided to become a computer scientist instead (a software engineer). It seemed more practical. I didn't want to have to worry about finances.

*Do you remember your first experience with computers?*

**Matt:** I first became interested in computers when my parents brought home our first computer. I immediately took it over. I figured out how it worked and became the resident expert on how to fix it. I played a lot of games back then like the Lucas Arts adventure games. Later on when I was in math courses I programmed my graphing calculator to automate all my tasks.

*Why did you choose UM?*

**Matt:** Initially I went to college because that was what was expected of me. My first semester really wasn't all that good. I ended up taking four years off and hanging around Chicago. I managed a Blockbuster Video store and worked in different warehouse jobs. Eventually I realized working retail is not what I wanted to do for the rest of my life. One of my good friends got accepted to UM it was really serendipitous. I decided I needed to go back to college. We roomed together my first year here.

*What would you like to do when you finish your Bachelor's degree?*

When I finish my Bachelor's degree I would like to get into scientific computing or high performance computing. Last year I went to Alaska for ten weeks in the summer to work on Don Morton's weather modeling project. That was such a great experience. I really learned a lot.

*Did you like Alaska?*

**Matt:** Fairbanks has a smaller population than Missoula but geographically it is larger. Everything is spread out it was good to experience that. We did a lot of hiking, rafting, and kayaking. It was a lot of fun to do.

*Tell us about what you will be doing this semester with Dr Reimer.*

**Matt:** This semester I will be working as an undergraduate researcher for Yolanda Reimer on her student note taking project. It is basically a unified program with a complete web browser and a note taking component. It is linked to Microsoft Office and has file transfer capability. It is basically one handy window with all the tools for note taking. It is really interesting.

*What do you see in your future?*

**Matt:** After pursuing my graduate degree, I would like to work for the government like NASA or something. Science is my favorite part of this degree. You really have to learn a lot of different things to be able to apply them to science. When I was a kid I wanted to be an astronaut. That is how I became interested in Astronomy. My personal goals right now are short term like having

time for ordinary hobbies. I like digital photography, hiking, fishing, and hunting. I would like to get a nice classic car like a 72' Chevelle and restore it.



*Do you have any advice for your fellow undergraduates?*

**Matt:** Learn to love math. At first I didn't like it so much because I felt intimidated. I found out a lot of people were equally confused. A lot of people think, "What is the point if I can't do my checkbook with this?" They don't think it is practical. It is tough to find the motivation. I would say don't get discouraged and ask a lot of questions. When I started asking questions I found a lot of people were willing to help me. In this degree you use math 75% of the time. You can't really do without it. Especially in your upper division classes they assume you already have a solid background.



## Mr. Culp

Michael Culp is a senior in CS with a math minor. Michael spent 10 weeks at the Arctic Region Super Computing Center (ARSC) this summer working for Dr Don Morton. Michael is currently an Undergraduate Research Assistant for Dr Morton and the President of the Computer Science Club for the CS department.

He has also been a lab monitor and a grader for the CS department for two years.

Michael's hobbies are text based

video games (like Lensmoor), hiking, pool (he practices up to 5 hours a week), judo (he has a yellow belt), and rafting.

*Michael, when did you first become interested in computers?*

**Michael:** The first time I remember using a computer I was 5 years old. My parents had a Commodore 64. I remember playing a race car game that my brother had at the time. When I was 7 or 8 my parents bought a top of the line Windows computer. I went from playing video games to playing with the computer's settings. I tried to become familiar with the operating system and what it could do.

*Did you continue working with computers in high school?*

**Michael:** I started programming in high school. My role model was my Computer Applications instructor who was my soccer coach when I was really young. He really started me in programming. We started out using Quick Basic and then Perl. The school actually came down on





him for teaching programming without a CS degree so it ended with that. Because we couldn't program anymore at school I got into Greek and Roman history. I took Latin for 3 years and got into oil painting. Painting is an expensive hobby, so I may pick it up later in life. I like the technical aspect of painting, like trying to make the reflections of water look real. It is like trying to look through a sphere to get the angles right.

*Tell us about the project you worked on this summer for Dr Morton.*

**Michael:** This summer I spent 10 weeks at ARSC in Fairbanks Alaska. I stayed in the dorms with Michael Jacobi. The Arctic Region Super Computing Center is actually a government site for super computing. It is really advanced compared to anything around here. I was really impressed by the supercomputers. They have robotic arms that access the memory tapes and they run really hot. They have a really good air-conditioning system running where they are located. My job was to try to implement a GUI for the Weather Research Forecasting Model (WRF) on the supercomputer (Midnight). My biggest challenge was to make the WRF portal run a simple case for the WRF model. I worked on creating a user's guide to aid non technical users in running WRF models. For example we were trying to write for a meteorologist who works at the weather station but is not savvy when it comes to Linux. Basically, I was trying to create a GUI to enlarge the number of users in the WRF portal.

*What did you think of Alaska?*

**Michael:** Alaska's terrain is similar to Montana but it has much thicker forests and a lot of swamps. Basically there is a layer of perma-frost under the ground and when it rains the rain hits the perma-frost it can't penetrate the ground so it builds up over time and becomes a swamp. This means a lot of mosquitoes. It seems like there is a wider variety of vegetation like arctic flowers in Alaska compared to Montana, but less of a variety of wildlife. The first week we were there I signed up for a hike and whitewater rafting trip. The hike was through the Bison Gulch Valley and the rafting trip was down the Ninana river. The water was freezing cold. In some spots it was about 34 to 36 degrees. Around the 3<sup>rd</sup> week I went on a 15 mile hike and ended up twisting my ankle (on the 13<sup>th</sup> mile) while walking over some planks over the perma-frost. I had to limp back for 2 miles.

*Tell us about your undergraduate research for Dr Morton this semester.*

**Michael:** This semester I am continuing on in the research. My major goals are to get the WARF portal to run WRF models in parallel (a process running on multiple processors). One of the problems with the project is that it would only run on one processor, limiting the models and test cases. Basically, predicting 96 hours of weather would take 6 hours to calculate on 32 processors. There are a lot of variables involved, physics, 3-D modeling, temperature, We use ordinary differential equations to see the rate of change in the variables. Basically it is like a grid system with all the different variables (observed data) trying to share processes to calculate predictions for the future.

**Michael:** We are going to try to increase the usability of the WRF portal and maybe even create a web browser portal to run models so that it is easier to access WRF. I may also get a chance to learn how to install WRF on a smaller supercomputer.

**Michael:** This semester I have decided to take on the challenge of the Computer Science Club. I am the President and my Vice President is Peter Wolf. We are going to try to structure the meetings to do things that are of interest to Computer Scientists. We plan on having seminars,



*To learn more about Dr Morton click the picture above or check out the CS website*

game nights, and generally try to learn things of interest.

*What are your plans for the future?*

**Michael:** After I graduate from here with my Bachelor's degree I would like to try to get into a program that you can get your Master's and PhD combined. I would like to try to go somewhere that isn't too much bigger than the towns in Montana. I will miss Montana and the snow if I end up leaving.

## Mr. Jacobi



**Michael Jacobi:** Michael was born in Fairfax Virginia and moved to Issaquah Washington when he was eight years old. His father has worked for Lotus, IBM and now works for Microsoft. Michael is currently an Undergraduate Researcher for Dr Don Morton.

*Michael, when did you first become interested in computers?*

**Michael:** When I was 5 years old I would sit on my dad's lap and play Lemmings 2d and some space games. When I was 6 or 7 my dad hooked up a LAN in our house and we played Doom in separate rooms. We had walkie-talkies and he would give me instructions because I couldn't type.

*What were your interests in High School?*

**Michael:** In high school I liked to do Cross Country. I really like running, but not really competitively. I liked playing table tennis, Halo, and basketball, normal high school stuff.

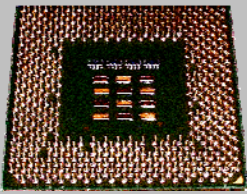
*Why did you decide to major in Computer Science?*


**Michael:** I would really like to have my own business. I was planning on being a business major, and then during orientation I changed my mind and chose Computer Science. I am really happy with my choice. I feel like I have a lot more long term focus than my friends from high school. I would still like to own my own business and may take a few business classes on the side.

*Tell us about your projects for this semester.*

**Michael:** This semester I am an Undergraduate Researcher for Don Morton and I am also trying to be a senator for ASUM. There is an open position and I will be interviewed by a Board. I moved into a house with 5 friends this semester and we are having a lot of fun so far. We have theme night dinners. Tonight we are doing Chinese food and we will all chip in on the groceries. Tomorrow we are having a ties and tie-die night. I really like my room mates although we did have some controversy before we moved in over who would get what room. We were e-mailing each other schematics. (laughs) One of my roommates is a math tutor so it is great to study with her.

*This summer you went to Alaska to work with Dr Morton on his weather modeling project tell us about that.*





**Michael:** I really enjoyed the people I was around this summer. It was great to be around older smart, mature students. They were looking at Grad schools and researching. We still chat on g-mail. Most of them were studying Physics, Computer Science, and Computer Engineering. It was also interesting to meet Native Alaskans. They told me how they get \$1000 to \$2000 a year from the gas Alaska produces. They let me try some whale. Each Indian village has a limit of 32 whales per year which can feed up to 5,000 villagers.

*Tell us about the research you were doing in Alaska.*

**Michael:** The research I did this summer was to produce visualizations for forecasted weather data using Dr Morton's script. Basically, to make comparisons between observed and forecasted data (data visualizations).

*This semester you are continuing research for Dr Morton. Tell us about that.*

**Michael:** This semester I have been creating graphs for comparison charts. I graph the differences between forecasted vs. observed weather data. Basically they are data visualizations.

*What are your goals once you graduate?*

**Michael:** My ultimate goals are to get a job related to my degree. I would like to have a family. I am really interested in cutting edge technology. Right now is the most fun I have ever had in my life. I am enjoying my freedom. I have a great balance between my work and school.