University of Manitoba Faculty Profiles

Dr. John Anderson
Professor, Computer Science, U of M

What opportunities do undergraduates have in your lab?

Our lab does work in autonomous intelligent systems, studying the principles of artificial intelligence through the construction of whole systems designed to function in a given domain. We do many of our implementations on humanoid robots and deal with issues like balancing and hand-eye coordination that are more complicated and interesting than simple wheeled robots. There are opportunities in all of these areas.

Why is research experience valuable for undergraduates?

More and more classes are bringing in examples of research, but you get only a limited perspective in a class. You tend to see an overview of a finished project or a work well in progress, and this is very different than experiencing the process yourself. You also tend to be surprised at how much you actually apply from all the classes you have taken, not just ones you enjoyed the most or those you think are core to your field. A lab is also a busy place, and you see the connections between your research and lots of other work, and that the research process is much broader than just any one project.

What value do undergraduates get from publishing?

While getting a publication is often on students' minds in terms of having an artifact come out of their work (or even just adding something to their CV), the process itself is not something most students arrive knowing much about. Not only does getting something ready for publication improve writing and communication in general, the detail-oriented work of properly documenting a project and describing it so that others can make use of it improves many other skills. Literature reviews themselves are also important – after doing a few you begin to see that sometimes your early description of a problem can change a great deal once you see and relate the work others have done.

What does it take to be successful in computer science?

Our field is hugely broad, and part of being successful is a willingness to see at least a little of all its pieces. A bigger issue though is being able to focus on computation rather than tools – the languages, systems, machines you use today will come and go; even being good at those in use is a fleeting talent. Being able to focus on the principles and adapt them to the problems (and tools) you see over time is important.

What advice would you give students in computer science?

Try to expose yourself to a broad range of experiences; never discount a particular area because it does not agree with you very much. You will find over time that they are all relevant.

Dr. Mark Hanson
Associate Professor, Environment & Geography, U of M

What opportunities do undergraduates have in your lab?

Any number! I'd love to have a student come to me with a study or project they'd like to pursue. I enjoy coming up with honours and summer research for students, but I'm just one person, and my ideas are maybe getting stale.

Why is research experience valuable for undergraduates?

The importance would be similar to any area I suspect; to get a sense of whether that type of inquiry is for you. If not, you find out easily and early and can keep looking. It is also an opportunity to shine if you are willing to put in the time and effort. When an undergraduate excels in the lab, it is noticed. The experience also opens the door to graduate school or, at the very least, letters of recommendation from someone that has had some real interactions with the student.

What value do undergraduates get from publishing their research or literature reviews?

Publishing is the mechanism by which the scientific and other communities share what they have discovered (or not found, which can be just as important). Otherwise, what we have learned is lost. It also reveals to the student both the power and flaws of peer review. Peer review and publishing exists because people will spend the time, and even put their reputations out there, to see new knowledge shared. Someone takes the time and energy to evaluate our work, and we have this conversation around the quality and value of our work that few people outside the process experience or understand. The student gets to see that they are part of a bigger whole.

What does it take to be successful in ecotoxicology?

The cynic in me says you take single, un-replicated studies and observations and instead of questioning the data, you proclaim to all who will listen that you have found the contaminant X that is responsible for environmental problem Y. Those days, I hope, are changing. It is becoming more and more about better studies, data openness, and collaborations between academics, government, and industry in order to tackle the challenges we face collectively.

What advice would you give students in ecotoxicology?

Ecotoxicology is truly inter- and multi-disciplinary. I can't stress enough the need to take a diverse range of courses in the sciences (and statistics!). Finally, design your studies to refute your hypotheses. This goes pretty much for everyone. Your goal in the end should not be to see an 'effect', but to help better understand and protect the environment.