Teaching Statement

Thomas R. W. Scogland
tom.scogland@vt.edu

Working with students and helping them to find their way to understanding is a source of great joy and pride to me. My teaching philosophy is based on my observations as a student, a TA, and a mentor through my undergraduate and graduate career. I look forward to teaching all facets of high-performance computing, including parallel, distributed, and heterogeneous computing, operating systems and code optimization courses. Additionally, I am qualified to teach networking, system administration, and introduction to databases.

1 Experience

During my time in higher education, I have served as a teaching assistant for a total of five courses, three at the undergraduate level and two at the graduate level, across a range of topics including operating systems, tablet PC applications, networking and parallel computing. In addition to my time as a TA, I have also guest lectured for classes in computer architecture and software co-design. Each of these has deepened my understanding of the subject matter by allowing me to experiencing the material anew through the eyes of students, and given me an opportunity to learn common challenges faced by students, and teachers, in each area.

Outside of the classroom, I have had the opportunity to mentor a number of students. As an undergraduate, after serving as a new member of the projects myself, I had the opportunity to mentor new students in both the Engineering Projects in Community Service program and as part of the ActiveMap project for a year each. In each case leading groups of three younger students. Since entering graduate school, I have expanded this role by serving as mentor to a number of students at the undergraduate, masters and even PhD level in some cases. This also led to my developing, organizing and presenting a set of tutorials for students in and out of my lab, with attendance ranging from 15 to 25 students and staff. The tutorials included topics ranging from working effectively on remote Unix/Linux computers, terminal-based editors, source control system usage and effective graphing and statistics with open source software.

2 Philosophy

My teaching philosophy centers around the belief that students should always have a reason to *want* to know the material before it is presented to them. Rather than lecturing on a subject and only later assigning students a task to perform with the material, I prefer to invert the model. Instead presenting students with a task to complete, which will require the knowledge at hand, and only then teaching how to accomplish it. In my experience, both as a student and as a TA, I have found that students learn more readily, participate more and are generally more attentive when they have a task in mind *before* the material is presented to them. Partially as a consequence, I prefer to focus on presenting general concepts, and leading the discussion to cause students to actively participate by inquiring or infer into the specifics of the material. The goal is to help students achieve understanding and increased competence through a course, and skills of rote memorization and regurgitation of specific details are far less important.

Another important part of my philosophy is that concepts should be taught such that they flow naturally from concepts or experiences common to the students of a class. In computer science and engineering, one

of the great problems facing us today is a lack of parallel computing expertise. One reason given for this is that parallel programming, and thus the teaching of parallel programming, is hard for teachers to teach and college students to learn. As part of the MyVICE project at Virginia Tech I participated in the development of a programming curriculum for students in kindergarten through high-school, which included basic parallel programming. The high-school students I was fortunate enough to work with on one occasion had no trouble, in fact had fun, learning how to make things happen in parallel in their programs. By using an environment that lends itself to thinking in parallel, in this case the creation of scenes in Storytelling Alice, students naturally grasp and explore the concept. I sincerely believe that designing material to be followed in this way can help increase student understanding and engagement at all levels.