

# Nicholas F. Polys: Teaching and Advising Statement

## ***The Nature of Teaching***

My philosophy centers around preparing students for critical thinking and communication. While fundamentals such as algorithms, data structures, software engineering, and programming languages are essential in producing capable graduates, the methods of assessing and applying technologies to real-world problems will prepare them for the challenging and changing world of Computer Science. I believe that this flexibility to adapt requires a strong base in engineering methodology as well as technical writing and presentation. In terms of innovation and creativity, I am a strong advocate of exposing students to the many multi-disciplinary connections of modern computing such as cognitive psychology, artificial intelligence, and information and interface design.

As a graduate of both a small liberal arts college and a large state university, I have experienced a range of class sizes and teaching styles. No matter the scale, the best have something in common - the passion and humor of the professor. It is this tradition I hope to continue at your institution.

## ***Experience***

My specific teaching experiences began in the areas of system languages such as UNIX, publication technologies such as XML and server-side processing, and the building of real-time 3D graphics applications for virtual reality and information visualization. In general, these courses focused on what functionalities the technology exposed, the pitfalls and strategies in using those technologies effectively, and assignments or projects that gave the opportunity to practice those strategies. It is a crucial responsibility of the teacher to provide the proper context (i.e. strengths and limitations) of various technologies and techniques. This responsibility has been manifested as an instructor for faculty classes (Deep Media for Research and Education) and undergraduate classes such as Introduction to Human Computer Interaction and Media Computation.

## ***Content***

I have a solid background in programming, databases & data structures, user interface software and web technologies. My goals for teaching include courses on: Human-Computer Interaction, Information and Interaction Design, Graphics and Visualization, and Information Architectures (i.e. networked publication and delivery). For multi-disciplinary areas or team-taught courses such as in the areas of Cognitive Science, I am especially interested in teaching topics of human and machine performance for perception and action, and knowledge and reasoning.

In addition, I am committed to guiding students along the paths that inspire and engage them. Inciting and enabling their fascination and passions may be the most valuable tools a teacher can give. I have advised both undergraduates and graduates in research projects while at Virginia Tech. The undergraduates learned about IRVE software engineering and system integration while the graduates developed and ran usability studies. In advising both of these projects, I successfully led students to complete research of international relevance and quality.

## ***Rewards***

Through this experience, I have learned the value of providing clear goals for pedagogy and projects and using 'progressive disclosure'. This approach gives students a specific problem but does not specify the means of realization in full detail. Instead, their understanding evolves step-by-step: as new questions arise, new resources are provided. This is an opportunistic methodology that helps reduce overload and confusion. In many cases the student's solutions are novel, and would not have been found if the means had been pre-ordained. This underscores my commitment to building critical thinking skills in students so that they may effectively develop and deploy the latest computing technology.