Extensible Programming and Specification Languages
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In this talk, I will describe our research in extensible languages. This work begins with the realization that programming languages and programming tasks are rarely a perfect fit: a program can often be clarified by using a number of language features tailored to the task at hand. These "domain-specific" features typically do not exist in general purpose languages. One approach to making such high-level features available is "extensible languages". An extensible programming language allows a programmer to import into her extensible "host" programming language the unique combination of domain-specific language features that raise the level of abstraction of the language to that of the problem domain. These features may be (i) new language constructs describing high-level abstractions in a domain, (ii) semantic analyses that, for example, check that the programmer has used the new language constructs correctly, or (iii) optimizing program transformations that rewrite a program into a more efficient form. This imperfect fit between languages and tasks also exists in the realm of software specification and thus we are also interested in extensibility as it applies to modeling and specification languages. I will describe the underlying language processing mechanisms our extensible compiler framework employs to build extensible programming and specification languages (higher-order attribute grammars extended with "forwarding") and demonstrate these ideas with a prototype implementation.

Biography
Eric Van Wyk is an Assistant Professor in the Computer Science and Engineering department at the University of Minnesota. He received his Ph.D. from the University of Iowa in 1998 and was a post-doctoral researcher in the Computing Laboratory at Oxford University before joining the University of Minnesota in 2002. The primary focus of his research is extensible programming and specification languages and the extensible compiler frameworks that implement such languages. He is also interested in the use of temporal logic to specify data flow analyses, how these can be used as side conditions in optimizing transformations and in proofs that the transformations are correct. Dr. Van Wyk is a 2005-2007 McKnight Land-Grant Professor and the recipient of an NSF CAREER Award.

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