Madeline Endres

PhD Candidate, University of Michigan
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Dear Faculty Hiring Committee,

My name is Madeline Endres, and I am applying for the role of a tenure-track Assistant Professor of Computer Science at University X.

I am currently a PhD Candidate in Computer Science at Michigan, where I research **software engineering** using **programming languages** techniques and human factors. My goal is to help programmers become more supported and productive, regardless of background. I am excited by the possibility of continuing my research as a professor at University X. *Sentences that are specific to University X.*

Research: I use novel algorithms and theoretically-grounded interventions to help programmers become experts faster. I improve software productivity via three lenses: leveraging program synthesis and machine learning to develop efficient and usable programming support, using cognitive insights to design effective programmer training, and addressing non-technical productivity barriers. In my research, I make use of creative experimental design, evidence-based results via large-scale evaluations (with millions of programming interactions or hundreds of human subjects), and interdisciplinary skill sets from outside software engineering (including programming languages, machine learning, psychology, and medicine). My research has contributed to 16 peer-reviewed publications (13 conference, 3 workshop) including 10 in top Software Engineering and Programming Languages conferences (ICSE, ESEC/FSE, PLDI, OOPSLA, ASE). My work on increasing participation in open source software for social good received a distinguished paper award at FSE 2023. In support of my research, I have secured $82,700 from the University of Michigan and the NSF, and I was awarded the NSF GRFP in 2020.

If hired as a faculty member at University X, I would be excited to continue research in all three productivity lenses. Ultimately, I hope to work toward *a paradigm shift in both broadening who programs and also in prioritizing effective technical communication as a driving force in software*. As AI and low-code environments help programming become more accessible to those without formal training, I foresee a need to support a wider range of individuals to communicate precise ideas. My focus will be on creating training and support mechanisms to help people effectively and efficiently read, understand, communicate, and verify technical formalisms and programs, regardless of whether they are human or machine-written.

Teaching and Research Mentorship: I have been a teaching assistant for six different courses at the University of Michigan. These courses spanned the undergraduate curriculum including the introductory programming series, Discrete Math, and two upper-level electives (Software Engineering and Programming Languages). As a teaching assistant, I designed and taught weekly discussion sections to 40 students, wrote and graded exam questions, and fielded student queries, receiving positive evaluation scores. I also have experience with course design. I helped improve Michigan's upper-level Programming Languages syllabus, and I designed and taught a nine-week supplemental tutorial for introductory students that led to improved programming outcomes. Regarding research mentorship, I've acted as the primary advisor for seven undergraduate students, leading to four peer-reviewed publications with mentees.

Service and Climate: I am committed to supporting computing students with less represented backgrounds or pursuing non-traditional paths. To this end, I have helped lead sustainable departmental initiatives including co-organizing a diversity-focused speaker series and co-designing inclusively training for student instructors. I also support diverse groups in my research. For example, my peer-reviewed work identifying gender bias in student-teacher evaluations at Michigan has been used on internal committees to contextualize tenure and promotion applications.

I am very excited by the possibility of continuing my software engineering research as a professor of University X. I am particularly excited by X's demonstrated support for Y, and its Z research environment. On a personal note, Y (included for schools where I had a personal note to add).

Enclosed are my 1) latest CV, 2) research statement and reference list, 3) teaching and advising statement, and 4) statement on diversity, equity, and inclusion. My achievements in research, funding, and mentorship highlight my readiness for a tenure-track faculty role, where I am excited to work for a future with more supported, inclusive, and productive programmers. Thank you for your consideration of my application, and I hope to hear from you soon.

Sincerely,

Madeline Endres