



Kevin Leach, PhD • Senior Research Fellow

Date: October 31, 2020

Dear Search Committee:

I am writing to apply for an Assistant Professor position in the X Department at the Y.

I am a postdoctoral research scientist at the University of Michigan, Ann Arbor. I am an interdisciplinary researcher combining *systems security* and *dependable autonomous systems*. Compromised computer systems have led to disasters for companies and governments alike. More recently, advanced attackers have begun concealing malicious behavior as part of the ever-present security arms race. I believe that robust system design requires assuming an adversary will gain access to the system at some point. As a result, during my research career, I have (1) leveraged hardware support and Trusted Execution Environments (TEEs) to develop frameworks and techniques for robust and faithful system analyses to understand and defend against advanced evasive malware, (2) adapted these techniques to detect and remove vulnerabilities from intelligent autonomous systems and large-scale cloud infrastructure, and (3) used functional Magnetic Resonance Imaging (fMRI) to conduct studies of human subjects to understand cognition associated with developer decision-making. My work has been published in top-tier venues across several areas, including IEEE S&P, NDSS, DSN, ICSE, FSE, and EMNLP.

Based on this foundational interdisciplinary work, I would be excited to pursue several research directions as a faculty member at Y. In particular, I believe autonomous vehicles will be a disruptive technology whose security will become a critically important part of society. To that end, I will further apply TEEs to secure such autonomous vehicles by automatically detecting and removing vulnerabilities, even when an attacker is already present. Second, I believe humans in the loop still make critical security and safety decisions, and thus we can further improve system security by using medical imaging to understand both how developers make security-related decisions and how human operators respond to security threats. Both directions will position me well for high-impact research, attracting graduate students, and acquiring extramural funding.

I have mentored a total of 16 graduate students and 12 undergraduate research students in my career, including students from underrepresented groups. I have been the primary instructor of record for six different courses for over 1300 students while at the University of Michigan. I have also formally advised 150 undergraduate students during my service in the Undergraduate Advising Office.

Lastly, I have been working as a postdoctoral researcher while my wife was completing her doctoral degree. As a result, my postdoctoral research has spanned a total of five years across three different research groups. I have developed experience leading a research group, mentoring graduate and undergraduate students, navigating deans and university leadership, and communicating with students about important diversity, equity, and inclusivity concerns.

Enclosed for your consideration are my (1) latest CV, (2) statement on diversity, equity, and inclusion, (3) research statement, and (4) teaching statement. I am very excited about the possibility of continuing research with Y.

Sincerely yours,

Dr. Kevin Leach

Senior Research Fellow

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