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Postdoctoral Fellow | National University of Singapore

Cover Letter   Nov. 06, 2025

Dear Members of Hiring Committee,

I am writing to express my interest in a Postdoctoral Research position at the Institute for Research in Fundamental Sciences (IPM). I hold a **Ph.D. in Computer Engineering from the University of Tehran (UT)** and am currently a **Postdoctoral Fellow at the National University of Singapore (NUS)**. My research focuses on the intersection of **hardware security**, **machine learning for trusted computing**, and **system-level design for secure and reliable architectures**.

During my doctoral and postdoctoral studies, I have developed scalable design-for-security frameworks, including logic locking techniques and machine learning-based methods for hardware Trojan detection. My recent work at NUS, as a **visiting Ph.D. student** and a postdoctoral fellow, expands hardware security to post-quantum cryptography (PQC) and microarchitectural vulnerabilities, where I developed one of the first remote power side-channel attacks on Kyber (ML-KEM) running on x86 processors. This research revealed vulnerabilities in constant-time PQC implementations under cloud virtualization and contributes to building holistic frameworks for secure, high-performance computing systems.

Beyond my core research, I have collaborated with international groups at UT, NUS, and UC San Diego, mentored several graduate and undergraduate students, and organized a workshop on post-quantum cryptography and secure design automation (ICCAD 2025). I have also served as a teaching assistant for several graduate and undergraduate courses over multiple semesters, the details of which are included in my CV. In addition, I have contributed as a reviewer, co-reviewer, and artifact evaluator for top-tier international conferences, experiences that have strengthened both my technical expertise and collaborative research skills.

I am particularly interested in the IPM's research on secure hardware modeling, embedded AI, and system verification, as well as emerging efforts in near-memory computing, energy-efficient system design, and hardware design for machine learning architectures. I see strong potential for collaboration at the intersection of these areas, specifically developing reliable and security-aware design methodologies for energy-efficient, high performance, and ML-enabled computing systems. I am eager to contribute to your research groups and to help advance IPM's efforts toward developing the next generation of secure and intelligent computing architectures.

Enclosed are my CV and Research Statement, which provide further details about my academic background and research plans. I would be delighted to discuss how my expertise and research vision could contribute to IPM's initiatives.

Thank you for considering my application. I look forward to the opportunity to contribute to your research community.

Sincerely,

Mona Hashemi, Ph.D.
Postdoctoral Fellow, National University of Singapore