

# Mohammad A. Nouredine

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CURRENT POSITION	<b>University of Illinois at Urbana Champaign</b> , Urbana, IL <i>Research Assistant at the Coordinated Science Laboratory</i>	<b>August 2014 – Present</b>
EDUCATION	<b>University of Illinois at Urbana Champaign</b> , Urbana, IL <i>Ph.D. candidate at the Computer Science department</i> <ul style="list-style-type: none"><li>• Thesis: Achieving Network Resiliency using Theoretically-Sound and Practically-Realizable Designs.</li><li>• Research Advisor: Prof. William H. Sanders</li></ul> <b>American University of Beirut</b> , Beirut, Lebanon <i>M.S. in Computer Engineering</i> <ul style="list-style-type: none"><li>• Thesis: <i>Model Checking Software with First Order Logic Specifications using AIG Solvers</i></li><li>• Advisor: Prof. Fadi A. Zaraket</li></ul> <i>B.E. in Computer Engineering</i>	<b>August 2014 – Present</b> <b>September 2011 – May 2014</b> <b>September 2007 – July 2011</b>
PROFESSIONAL EXPERIENCE	<b>University of Illinois at Urbana-Champaign</b> , Urbana, IL <i>Research Assistant with the Performability Engineering Group</i> <ul style="list-style-type: none"><li>• Working on designing secure and intrusion-tolerant systems, with focus on combatting Internet denial of service attacks.</li><li>• Developed a Linux 4.13.0 kernel patch that employs client puzzles into the TCP stack</li><li>• Developed a theoretical framework to select client puzzle difficulties to combat denial of service attacks using game theory and network pricing theory.</li><li>• Working on designing secure and resilient bi-directional data flow mechanisms for Distributed Energy Resources</li><li>• Deployed and actively maintains the research group's private Openstack cloud.</li></ul> <b>American University of Beirut</b> , Beirut, Lebanon <i>Research Assistant with the Program Correctness Automation Lab</i> <ul style="list-style-type: none"><li>• Designed and implemented <math>\{P\}\mathcal{S}\{Q\}</math>, a tool that checks imperative code with first order logic properties, using And-Inverted-Graphs (AIG) solvers.</li><li>• Developed <math>BIP\{I\}</math>, a tool that checks Behavior-Interaction-Priority (BIP) systems with first order logic invariants using AIG solvers.</li><li>• Designed and implemented an imperative parallel programming language that generates architecture-aware parallel programs.</li></ul> <b>Ecole Polytechnique Federal de Lausanne (EPFL)</b> , Lausanne, Switzerland <i>Intern at the Rigorous System Design Laboratory (RISD)</i>	<b>August 2014 – Present</b> <b>August 2010 – July 2014</b> <b>August 2013 – November 2013</b>

**University of Illinois at Urbana-Champaign, Urbana, IL**

*Head Instructor for ECE 541: Computer System Analysis* **September 2018 – January 2019**

- Redesigned the class curriculum and material with well-defined objectives.
- Created homework assignments and exams.
- Delivered two 75-minute lectures weekly on theoretical and practical system analysis techniques.
- Advised students through course projects and conducted a class workshop.
- Ranked as an excellent instructor by the students through the Engineering College's Instructor and Course Evaluation (ICES) forms.
  - Average teaching effectiveness rating:  $> 4.6 / 5$
  - Average course quality rating:  $> 4.5 / 5$

**University of Illinois at Urbana-Champaign, Urbana, IL**

*Teaching Assistant for CS423: Operating Systems Design* **January 2018 – May 2018**

- Head Instructor: Professor Adam Bates.
- Maintained office hours and guided students through kernel programming tasks.
- Delivered lectures on the Linux kernel's memory management and an introduction to kernel security.
- Designed, implemented, and graded a machine problem relating to Linux Security Modules.

**American University of Beirut, Beirut, Lebanon**

*Teaching Assistant* **July 2011 – July 2012**

- Prepared and graded course projects for the Operating Systems and Computer Networks courses.
- Presented lectures about kernel device drivers and TCP socket programming, and provided support for students in their projects.

**Conference Papers**

1. Mohammad A. Nouredine, Ahmed M. Fawaz, Amanda Hsu, Cody Guldner, Sameer Vijay, Tamer Başar, and William H. Sanders. Revisiting client puzzles for TCP state exhaustion attacks tolerance. In *2019 49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2019
2. Wajih Ul Hassan, Mohammad A. Nouredine, Pubali Datta, and Adam Bates. High-fidelity attack investigation with universal provenance. In *Network and Distributed System Security Symposium (NDSS)*, 2020. To Appear
3. A. M. Fawaz, M. A. Nouredine, and W. H. Sanders. POWERALERT: Integrity checking using power measurement and a game-theoretic strategy. In *2018 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, pages 514–525, June 2018
4. Atul Bohara, Mohammad A. Nouredine, Ahmed Fawaz, and William H. Sanders. An unsupervised multi-detector approach for identifying malicious lateral movement. In *2017 IEEE 36th Symposium on Reliable Distributed Systems (SRDS)*, pages 224–233, Sept 2017
5. Mohammad A. Nouredine, Ahmed Fawaz, William H. Sanders, and Tamer Başar. A game-theoretic approach to respond to attacker lateral movement. In *Proceedings of the 7th Conference on Decision and Game Theory for Security (GameSec)*, November 2-4 2016
6. Mohammad A. Nouredine, Andrew Marturano, Ken Keefe, William H. Sanders, and Masooda Bashir. Accounting for the human user in predictive security models. In *Proceedings of the 22nd IEEE Pacific Rim International Symposium on Dependable Computing (PRDC)*, January 22-25 2017
7. Mohamad Nouredine, Mohamad Jaber, Simon Bliudze, and Fadi A. Zaraket. Reduction and abstraction techniques for BIP. In *Formal Aspects of Component Software*, volume 8997, pages 288–305. 2014
8. Fadi A. Zaraket, Mohamad Nouredine, Mohamed Sabra, and Ameen Jaber. Portable parallel programs using architecture-aware libraries. In *Proceedings of the 27th Annual ACM Symposium on Applied Computing-Poster Session*, pages 1922–1924. ACM, 2012

## Journal Papers

1. Fadi A. Zaraket, Mohamad Jaber, Mohamad A. Nouredine, and Yliès Falcone. From high-level modeling toward efficient and trustworthy circuits. *International Journal on Software Tools for Technology Transfer*, Jun 2017
2. Mohammad A. Nouredine and Fadi A. Zaraket. Model checking software with first order logic specifications using AIG solvers. *IEEE Transactions on Software Engineering*, 42(8):741–763, Aug 2016

## HONORS AND AWARDS

- Recipient of the UIUC College of Engineering’s Mavis Future Faculty Fellowship (MF3) for the academic year 2018 – 2019.
- Ranked as an excellent instructor after being the head instructor for ECE541: Computer System Analysis during the Fall 2018 semester.
- Graduated with high distinction from the American University of Beirut.
- Placed in the Dean’s honor list in all semesters attended at the American University of Beirut.
- Received a full scholarship from the Lebanese Government to attend undergraduate college at the American University of Beirut.
- Ranked third nationwide in the Lebanese national high school exams, July 2007.

## SERVICE

- Reviewed several research papers submitted at the IEEE International Conference on Dependable Systems and Networks (DSN) 2018 and 2019.
- Volunteer at Code.org in order to help spread computer programming education in schools.
- Member of the Institute for Electric and Electronic Engineers (IEEE).
- Member of the Lebanese Boy scout Association for 12 years (1995 – 2007) assuming a high leadership position as a patrol leader.

## TECHNICAL SKILLS

<i>Cloud Computing</i>	OpenStack, Ubuntu Landscape, Autopilot, Red Hat RDO
<i>Programming Languages</i>	C, C++, Python, Java, Linux shell scripting
<i>Operating Systems</i>	Linux kernel development, TCP/IP sockets

## LANGUAGES

Excellent speaking and writing skills in English, French and Arabic