

Ahmed Elhassany

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Palestinian, B-Permit

Born April 1st, 1986



Education

- 2015–2019 **Ph.D. at Department of Information Technology and Electrical Engineering, ETH Zürich, Switzerland.**
Dissertation: Towards Reliable Network Control Planes
Advised by: Prof. Laurent Vanbever
- 2009–2011 **M.Sc. Computer Science, University of Delaware, Newark, DE, USA.**
- 2003–2008 **B.Sc. Computer Engineering, Islamic University of Gaza, Gaza, Palestine.**

Professional Experience

- June '15 – Present **Research Assistant, ETH Zürich, Switzerland.**
- Developed systems to automatically synthesize router configurations from high-level requirements. <https://github.com/nsg-ethz/synet-plus>, <https://github.com/nsg-ethz/synet>. Published in [1, 2, 10].
 - Developed a system to detect concurrency violations in production-grade controllers of Software-Defined Networks (SDN). <https://github.com/nsg-ethz/sdnracer>. Published in [3, 4, 6].
 - *Technologies used:* Cisco IOS, BGP, OSPF, Python, SDN, Z3 SMT Solver, Git.
- June – Sept. '18 **Software Engineer Intern, Facebook, Menlo Park, CA, USA.**
- Started a practical network verification initiative.
 - Built a prototype system to verify the correctness of Facebook's network.
 - *Technologies used:* Python, Thrift, Mercurial.
- Jan – May '15 **Research Associate, Indiana University, Bloomington, IN, USA.**
- Measured garbage collector and data serialization overhead for unstructured data.
 - Developed efficient method for representing unstructured data in Haskell's runtime system. Published in [5].
 - *Technologies used:* Java, Continuous Integration/Deployment (CI/CD), Git.
- July '13 – Nov. '14 **Research Scientist, International Computer Science Institute (ICSI), Berkeley, CA, USA.**
- Worked in Prof. Scott Shenker's group on designing and building next-generation SDN architecture (SDNv2).
 - Integrated a research system for quality assurance to run in a production environment with ONOS; a carrier-grade SDN open-source network operating system. <http://onosproject.org/>. Published in [7].
 - *Technologies used:* Python, Java, Continuous Integration (CI), QA, Git.

- May – July '13 **Summer Student**, *Lawrence Berkeley National Lab.*, Berkeley, CA, USA.
- Worked with the Energy Sciences Network (ESnet) team.
 - Developed a scalable multi-domain Network Topology Service for dynamic multi-domain network circuits' setup. <https://github.com/ahassany/topology-service>
 - *Technologies used*: Java, Jetty, Atmospher Framework, REST API design, MongoDB.
- Aug. '11 – July '13 **Research Associate**, *Indiana University*, Bloomington, IN, USA.
- Developed a RESTful Unified Network Information Services (UNIS) to represent topologies for large-scale multi-domain networks. Published in [8].
 - Developed instrumentation and monitoring APIs and tools for GENI <https://www.geni.net> experiments and physical infrastructure; <https://github.com/periscope-ps/unis>.
 - *Technologies used*: Java, Python, Tornado, REST API design, MongoDB, Django, Git.
- August '10 **Summer Student**, *Lawrence Berkeley National Lab.*, Berkeley, CA, USA.
- Worked at the Center for Enabling Distributed Petascale Computing (CEDPS) project.
 - Developed a system to collect, represent and analyze large scale monitoring data for high-speed data transfers in DOE networks.
 - *Technologies used*: Python, Tornado, JavaScript, HTML, JQuery, MongoDB, Django.
- Feb. '09 – July '09 **Software Engineer**, *Municipality of Gaza*, Gaza, Palestine.
- Designed a system to extract information, categorize, and archive old building permits from the late 1800s.
 - Designed a new business process and the required software for issuing new building permits in Gaza city.
 - Lead a team of 50 civil engineers and 20 data entry persons to implement the project.
 - *Technologies used*: Oracle DB, Visual Basic .NET, Delphi.
- Dec. '08 – Mar. '09 **Independent Consultant**, *Palestinian National Internet Naming Authority (PNINA)*, Gaza, Palestine.
- Software quality assurance of in-house built system for registering and managing all .ps domain names; PNINA is the country code top-level domain (ccTLD) for Palestine.
 - Consulting on deployment and integration for new domain registration system.
 - *Technologies used*: PHP, Perl, PostgreSQL, MySQL, BIND, Apache.
- June – Sept '08 **Student Developer**, *Google Inc. & Internet2*, Google Summer of Code 2008.
- This project is sponsored by Google and administrated by Internet2.
 - Designed and developed open source web based configuration tools for perfSONAR-PS.
 - *Technologies used*: Perl, JavaScript, Apache, HTML, CSS, SVN.
- Sep. '07 – Mar. '08 **Software Engineer**, *AfkarIT*, Gaza, Palestine.
- Developed operating system level virtual machines monitoring system for VMWare ESX Infrastructure.
 - *Technologies used*: Python, C#.
- Sep. '04 – Oct. '05 **Contractor Software Engineer**, *Ard El-Insan*, Gaza, Palestine.
- Developed patients follow-up management system in four clinics for a project sponsored by European Commission's Humanitarian Aid Office (ECHO).
 - *Technologies used*: Visual Basic .NET, Microsoft SQL Server.

Awards

- Fulbright Foreign Student Scholarship for Master's program, 2009 – 2011.
- 2nd place winner team at IEEE/ACM Supercomputer Conference 2009 (SC '09) High Performance Computing Contest.
- Google Summer of Code, 2008.
- Palestinian Prime Minister's special award for undergraduate achievements, 2008.

Activities and Services

- Reviewer: IEEE/ACM Transactions on Networking.
- ParLab Boot Camp. Course on parallel programming, UC Berkeley, 2010.
- SCinet volunteer. ACM/IEEE Supercomputing Conference (SC '10, SC '11, and SC '12). <http://sc12.supercomputing.org/content/scinet.html> 2010 – 2012.
- President of Graduate Students Association for Computer Science Department at University of Delaware, 2010 – 2011.
- From Lab to Market, Fulbright Enrichment Seminar, Austin TX, June 2009.

Presentations and Invited Talks

Network-wide Configuration Synthesis.

- Facebook's network platform team. July 2018. Palo Alto, CA, USA.
- In the International Conference on Computer-Aided Verification (CAV'17), <https://youtu.be/dUbfWtHLTCI>. July 2017. Heidelberg Germany.
- Workshop on Network Verification. <http://network-programming.org/wnv>. April 2017. Palo Alto, CA, USA.

BigBug: Practical Concurrency Analysis for SDN .

- ACM Symposium on SDN Research (SOSR '17). April 2017. Santa Clara, CA, USA.

SDNRacer: Concurrency Analysis for Software-Defined Networks.

- ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI'16). <https://youtu.be/QzYBOc3G9FU>. June 2016. Santa Barbara, CA, USA.

UNIS: Design and Implementation of a Unified Network Information Service.

- IEEE Conference on Services Computing (SCC '13). July 2013. Santa Clara, CA USA.

Supervised Students

- Alexander Hedges, Semester Thesis, "Grigori: Continuous Integration Testing of Synthesize Router Configurations," 2018.
- Christelle Gloor, Semester Thesis, "Chronos: Finding the Configurations Recipe for Fast Convergence," 2017.
- Roman May, Master Thesis, "BigBug: Practical Concurrency Analysis for SDN," 2016.

Languages

- English: Fluent.
- Arabic: Mother tongue.
- German: Basic knowledge (A1 course).

Publications

Conferences

- [1] **A. El-Hassany**, P. Tsankov, L. Vanbever, and M. Vechev, "NetComplete: Practical Network-Wide Configuration Synthesis with Autocompletion," in *USENIX Symposium on Networked Systems Design and Implementation (NSDI 2018)*.
- [2] **A. El-Hassany**, P. Tsankov, L. Vanbever, and M. Vechev., "Network-wide Configuration Synthesis," in *International Conference on Computer-Aided Verification (CAV 2017)*.
- [3] R. May, **A. El-Hassany**, L. Vanbever, and M. Vechev, "BigBug: Practical Concurrency Analysis for SDN," in *ACM Symposium on SDN Research (SOSR 2017)*.
- [4] **A. El-Hassany**, J. Miserez, P. Bielik, M. Vechev, and L. Vanbever, "SDNRacer: Concurrency Analysis for Software-Defined Networks," in *ACM Programming Language Design and Implementation (PLDI 2016)*.
- [5] E. Z. Yang, G. Campagna, O. S. Ağacan, **A. El-Hassany**, A. Kulkarni, and R. R. Newton, "Efficient Communication and Collection with Compact Normal Forms," in *ACM SIGPLAN International Conference on Functional Programming (ICFP 2015)*.
- [6] J. Miserez, P. Bielik, **A. El-Hassany**, L. Vanbever, and M. Vechev, "SDNRacer: Detecting Concurrency Violations in Software-defined Networks," in *ACM Symposium on SDN Research (SOSR 2015)*.
- [7] C. Scott, A. Wundsam, B. Raghavan, A. Panda, A. Or, J. Lai, E. Huang, Z. Liu, **A. El-Hassany**, S. Whitlock, H. Acharya, K. Zarifis, and S. Shenker, "Troubleshooting Blackbox SDN Control Software with Minimal Causal Sequences," in *ACM Special Interest Group on Data Communication (SIGCOMM 2014)*.
- [8] **A. El-Hassany**, E. Kissel, D. Gunter, and M. Swany, "Design and Implementation of a Unified Network Information Service," in *IEEE International Conference on Services Computing (SCC 2013)*.

Workshops

- [9] E. Kissel, **A. El-Hassany**, G. Fernandes, M. Swany, D. Gunter, T. Samak, and J. M. Schopf, "Scalable Integrated Performance Analysis of Multi-Gigabit Networks," in *IEEE Network Operations and Management Symposium (NOMS)*, 2012.

Technical Reports

- [10] **A. El-Hassany**, P. Tsankov, L. Vanbever, and M. Vechev, "Network-wide Configuration Synthesis," *arXiv preprint arXiv:1611.02537*, 2016.

Demos

- [11] **A. El-Hassany**, E. Kissel, and J. Griffioen, "GEMINI Tutorial: Measuring and instrumenting GENI experiment. GEC 13-16, 2012–2013," ser. GENI Engineering Conference (GEC 13–16), 2012-2013.
- [12] **A. El-Hassany**, E. Pouyoul, V. Singh, B. Tierney, I. Monga, S. Gangualy, M. Ikeda, M. Swany, and E. Kissel, "Using Periscope to monitor End-to-End Circuit Service at Layer2 (ECSEL). SC '11," ser. ACM/IEEE Supercomputing Conference, 2011.

References

- References available upon request.