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DOB: 11.08.1989

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# Saahil Ognawala

## Education

- 2015–2019 **Doctor of Philosophy in Natural Sciences**, *Technical University of Munich*, Germany.  
Specialization: Software Engineering, Testing Intelligence  
Thesis Topic: Scalable Greybox Fuzzing for Effective Vulnerability Management
- 2012–2014 **Master of Science**, *Technical University of Munich*, Germany, 1.9.  
Specialization: Artificial Intelligence, Software Engineering  
Thesis Topic: Regularizing Recurrent Neural Networks
- 2007–2011 **Bachelor of Engineering**, *Manipal Institute of Technology*, India, 8.7.  
Thesis Topic: Active Data-in-Motion Security in Enterprise Networks

## Experience

- 2015–Current **Researcher and Ph.D. student**, *TU Munich*, Germany, Python, C, C++.  
◦ Adaptive hybrid combination of blackbox fuzzing and concolic execution to find low-level vulnerabilities in programs.  
◦ Compositional reachability and exploitability analysis of vulnerabilities.  
◦ Domain specific vulnerability assessment using experiential knowledge.
- 2018–2018 **Summer Intern**, *Imperial College London*, United Kingdom, Python, C, C++.  
◦ Tight integration between AFL fuzzer and KLEE concolic execution engine.
- 2012–2014 **Scientific Assistant**, *TU Munich*, Germany, Python, C.  
◦ Classification of surface texture for robot handling using deep-learning.  
◦ NLP-based analysis of user stories to gain insight into wrong estimations, for agile development companies.
- 2011–2012 **System Software Engineer**, *Hewlett-Packard Corp.*, Bangalore, India, C++, Java.  
◦ Development of the backbone architecture for SOAP based web services framework on HP's proprietary NonStop OS. Responsible for implementing WS-Security.
- 2011–2011 **Bachelor Thesis Intern**, *RSA - The security division of EMC*, Bangalore, India, C.  
◦ QA for Data Loss Prevention (DLP) and integration of two RSA products, viz. DLP and Archer (e-Governance, Risk Control Suite).
- 2010–2010 **Summer Intern**, *Jawaharlal Nehru University*, New Delhi, India, C.  
◦ Implementing and evaluating basic techniques of **web recommender systems** over MovieLens database.
- 2009–2009 **Summer Intern**, *Otto von Guericke Universitat*, Magdeburg, Germany, PHP.  
◦ Modelling **Software Failure Modes and Effects Analysis** (SFMEA) through a web tool; Analyzing risk factors in SPLC stages defined in different software development models.

## Relevant Academic Projects

- **Regularization of Recurrent Neural Networks** Python  
- Comparing the performance (w.r.t. vanishing gradients) of norm-based regularizers in deep time-series networks with advanced techniques like fast-dropout, Hessian-free optimization and spectral radii.
- **Tactile Manipulation (TACMAN) Using BioTac Data** Python  
- Using pressure, force, torque and piezoelectric sensor data to classify surface information such as friction and curvature, from robot hands.

- **Segmentation of Erythema in Multispectral Skin Images**

Python, C++

- Deep learning on spectral data from 10-channel camera to learn properties of lesions in different skin diseases; Real-time segmenting of affected skin regions.

- **Network Traffic Monitor**

C

- Implementing active 'data-in-motion' security; TCP packet sniffing and sensitivity checks using Perl style regular expressions.

## Teaching Experience

- **Modelling of Distributed Systems** M.Sc. Computer Science lecture course, *Summer semesters 2016, '17, '18*
- **Fuzz Testing for Vulnerability Detection** M.Sc. Computer Science seminar, *Winter semester 2016/17*
- **Introduction to Programming and Systems Engineering** M.Sc. Computer Science lecture course, *Winter semester 2016/17*
- **Secure coding**, M.Sc. Computer Science practical course, *Winter semester 2015/16*
- **Introduction to Software Engineering**, B.Sc. Computer Science lecture course, *Summer semester 2015*

## Key skills

Programming Languages Python, C, C++, Java, HTML, CSS  
Databases MySQL, SQLite, PostgreSQL  
Operating Systems Linux, Unix, MacOS X, Windows

## Languages

English **Second Native Level**  
Hindi **Native Level**  
German **B2**

## Interests

Kickboxing, bouldering, literature, Rubik's cube enthusiast (best time of 160s on 3x3), hip-hop and jazz music. I play the keyboard and melodica.

## References

To be provided on request.

## Publications

**Ognawala, S.**, A. Pretschner, T. Hutzelmann, E. Psallida, and R. N. Amato. Reviewing klee's sonar-search strategy in context of greybox fuzzing. *1st International KLEE Workshop*, 2018.

**Ognawala, S.**, R. N. Amato, A. Pretschner, and P. Kulkarni. Automatically assessing vulnerabilities discovered by compositional analysis. In *Proceedings of the 1st International Workshop on Machine Learning and Software Engineering in Symbiosis*, 2018.

**Ognawala, S.**, A. Petrovska, and K. Beckers. An exploratory survey of hybrid testing techniques involving symbolic execution and fuzzing. *arXiv preprint arXiv:1712.06843*, 2017.

**Ognawala, S.**, T. Hutzelmann, E. Psallida, and A. Pretschner. Improving function coverage with munch: A hybrid fuzzing and directed symbolic execution approach. In *Proceedings of the Symposium on Applied Computing*, 2017.

**Ognawala, S.**, M. Ochoa, A. Pretschner, and T. Limmer. Macke: Compositional analysis of low-level vulnerabilities with symbolic execution. In *Automated Software Engineering (ASE), 2016 31st IEEE/ACM International Conference on*, 2016.

M. Karl, A. Lohrer, D. Shah, F. Diehl, M. Fiedler, **Ognawala, S.**, J. Bayer, and P. van der Smagt. MI-based tactile sensor calibration: A universal approach. *arXiv preprint arXiv:1606.06588*, 2016.

A. Vetro, **Ognawala, S.**, D. M. Fernández, and S. Wagner. Fast feedback cycles in empirical software engineering research. In *Proceedings of the 37th International Conference on Software Engineering-Volume 2*, 2015.

A. Duliu, R. Brosig, **Ognawala, S.**, T. Lasser, M. Ziai, and N. Navab. Illumination compensation and normalization using low-rank decomposition of multispectral images in dermatology. In *International Conference on Information Processing in Medical Imaging*, 2015.

**Ognawala, S.** and J. Bayer. Regularizing recurrent networks-on injected noise and norm-based methods. *arXiv preprint arXiv:1410.5684*, 2014.

D. M. Fernández, **Ognawala, S.**, S. Wagner, and M. Daneva. Where do we stand in requirements engineering improvement today?: first results from a mapping study. In *Proceedings of the 8th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement*, 2014.

J. J. Cuadrado-Gallego, P. Rodríguez-Soria, A. González, D. Castelo, and **Ognawala, S.** Early functional size estimation with ifpug unit modified. In *Computer and Information Science (ICIS), 2010 IEEE/ACIS 9th International Conference on*, 2010.