

# Aanjhan Ranganathan

Steinstrasse 58 – 8003 Zurich – Switzerland

☎ +41 78 840 7113 • ✉ aanjhan@inf.ethz.ch • 🌐 www.aanjhan.com

## Education

<b>ETH Zurich</b> <i>Ph.D.</i>	<b>Zurich, Switzerland</b> <i>2010–2016</i>
<b>École Polytechnique Fédérale de Lausanne</b> <i>Master of Science, 5.62/6</i>	<b>Lausanne, Switzerland</b> <i>2008–2010</i>
<b>SSN College of Engineering (Anna University)</b> <i>Bachelor of Engineering, 82/100</i>	<b>Chennai, India</b> <i>2001–2005</i>

## Doctoral Thesis

**title:** *Physical-layer Techniques for Secure Proximity Verification and Localization*

**supervisor:** Prof. Dr. Srdjan Capkun

**description:** Analysed and proposed novel architectures for secure localization and proximity verification. Designed and implemented a spoofing resilient GPS receiver.

## Master thesis

**title:** *Snoop Filtering for Low Power Embedded Multiprocessor Systems*

**supervisors:** Prof. Dr. Paolo Ienne, Prof. Dr. Philip Brisk, Dr. Theo Kluter

**description:** Quantified the benefits of using cache snoop filters to reduce memory subsystem energy in embedded multiprocessor systems.

## Experience

Industry.....

<b>Robert Bosch Engineering and Business Solutions</b> <i>Senior Software Engineer</i>	<b>Bengaluru, India</b> <i>June 2005–June 2008</i>
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Internships.....

<b>Processor Architecture Laboratory, EPFL</b> <i>Research Assistant</i>	<b>Lausanne, Switzerland</b> <i>March 2010–July 2010</i>
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<b>Google Inc. (Summer of Code)</b> <i>Contract Employee</i>	<i>May 2009–August 2009</i>
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Teaching.....

<b>ETH Zurich</b> <i>Semester and Master theses supervision</i>	<b>Zurich, Switzerland</b> <i>September 2010–present</i>
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Locating tags using Unmanned Aerial Vehicles, Carl Olsson, Semester Thesis, 2015. Detection of Spoofing Attacks on Wireless Multilateration Systems, Patrick Leu (in co-operation with Armasuisse), Master Thesis, 2015. Detection of GPS Spoofing Attacks, Hildur Ólafsdóttir, Master Thesis, 2014. On the Security of Powerline Communication Systems, Baron Oldenburg, Semester project, 2012. Smart and Secure WiFi Pairing, Pascal Brogle, Masters Thesis, 2011.

<b>ETH Zurich</b> <i>Lectures (Masters)</i>	<b>Zurich, Switzerland</b> <i>September 2010–present</i>
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Topics include secure localization, distance bounding, broadcast communication authentication techniques, GPS, Anti-jamming techniques

## **ETH Zurich**

*Teaching Assistant*

Design of Digital Circuits (Bachelors), Security of Wireless Networks laboratory (Masters)

**Zurich, Switzerland**

*September 2010–present*

## **EPFL**

*Teaching Assistant*

Hardware System Modelling (Masters), Semi-custom EDA based VLSI Design (Masters)

**Lausanne, Switzerland**

*September 2009–December 2009*

## **Publications**

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[1]Aanjhan Ranganathan. *Physical-layer Techniques for Secure Proximity Verification & Localization*. PhD thesis, 2016.

[2]Daniel Moser, Patrick Leu, Vincent Lenders, Aanjhan Ranganathan, Fabio Ricciato, and Srdjan Capkun. Investigation of Multi-device Location Spoofing Attacks on Air Traffic Control and Possible Countermeasures. In *Proceedings of the 22nd Annual International Conference on Mobile Computing and Networking (MobiCom)*, 2016.

[3]Der-Yeuan Yu, Aanjhan Ranganathan, Ramya Jayaram Masti, Claudio Soriente, and Srdjan Capkun. SALVE: Server Authentication with Location VERification. In *Proceedings of the 22nd Annual International Conference on Mobile Computing and Networking (MobiCom)*, 2016.

[4]Aanjhan Ranganathan, Hildur Olafsdóttir, and Srdjan Capkun. SPREE: Spoofing Resistant GPS Receiver. In *Proceedings of the 22nd Annual International Conference on Mobile Computing and Networking (MobiCom)*, 2016.

[5]Aanjhan Ranganathan, Boris Danev, and Srdjan Capkun. Proximity Verification for Contactless Access Control and Authentication Systems. In *Proceedings of the 31st Annual Computer Security Applications Conference (ACSAC)*, 2015.

[6]Ramya Jayaram Masti, Devendra Rai, Aanjhan Ranganathan, Christian Müller, Lothar Thiele, and Srdjan Capkun. Thermal Covert Channels on Multi-core Platforms. In *Proceedings of the 24th USENIX Security Symposium (USENIX Security 15)*, 2015.

[7]Der-Yeuan Yu, Aanjhan Ranganathan, Ramya Jayaram Masti, Claudio Soriente, and Srdjan Capkun. W-SPS: Designing a Wide-Area Secure Positioning System. Cryptology ePrint Archive, Report 2015/230, 2015.

[8]Der-Yeuan Yu, Aanjhan Ranganathan, Thomas Locher, Srdjan Capkun, and David Basin. Short paper: Detection of GPS Spoofing Attacks in Power Grids. In *Proceedings of the 2014 ACM conference on Security and privacy in wireless & mobile networks (WiSec)*, 2014.

[9]Aanjhan Ranganathan, Boris Danev, and Srdjan Capkun. Low-power Distance Bounding. *arXiv preprint arXiv:1404.4435*, 2014.

[10]Nils Ole Tippenhauer, Luka Malisa, Aanjhan Ranganathan, and Srdjan Capkun. On limitations of friendly jamming for confidentiality. In *Proceedings of the 34th IEEE Symposium on Security and Privacy (S&P)*, 2013.

[11]Ramya Jayaram Masti, Claudio Marforio, Aanjhan Ranganathan, Aurélien Francillon, and Srdjan Capkun. Enabling Trusted Scheduling in Embedded Systems. In *Proceedings of the 28th Annual Computer Security Applications Conference (ACSAC)*, 2012.

[12]Aanjhan Ranganathan, Nils Ole Tippenhauer, Boris Škorić, Dave Singelée, and Srdjan Capkun. Design and implementation of a terrorist fraud resilient distance bounding system. In *Proceedings of the 17th European Symposium on Research in Computer Security (ESORICS)*, 2012.

[13]Aanjhan Ranganathan, Ali Galip Bayrak, Theo Kluter, Philip Brisk, Edoardo Charbon, and Paolo Ienne. Counting stream registers: An efficient and effective snoop filter architecture. In *Proceeding of the 18th IEEE International Conference on Embedded Computer Systems (SAMOS)*, 2012.

[14]Aanjhan Ranganathan, Boris Danev, Aurélien Francillon, and Srdjan Capkun. Physical-layer attacks on chirp-based ranging systems. In *Proceedings of the 5th ACM conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*, 2012.

[15]Aanjhan Ranganathan. Adaptation of Linux and \*BSD in automotive embedded software. Technical report, SAE Technical Paper, 2007.

## Talks

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- **Proximity Verification for Contactless Access Control and Authentication Systems:** Annual Computer Security Applications Conference, Los Angeles, USA, 2015.
- **SPREE: A Spoofing Aware GPS Receiver:** University of California, Los Angeles, USA, 2015.
- **Thermal Covert Channels on Multicore Platforms:** Usenix Security Symposium, Washington D.C., USA, 2015.
- **Design and implementation of a terrorist fraud resilient distance bounding system:** European Symposium on Research in Computer Security, Pisa, Italy, 2012.
- **Counting stream registers: An efficient and effective snoop filter architecture:** International Conference on Embedded Computer Systems, Samos, Greece, 2012.
- **Physical-layer attacks on chirp-based ranging systems:** ACM Conference on Security and Privacy of Wireless and Mobile Networks, Tucson, USA, 2012.

## Professional and Social Activities

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- Technical Program Committee member for "Smart Medical Devices - from Lab to Clinical Practice" workshop 2015, 2016
- Reviewer for IEEE/ACM Transactions on Networking 2015
- Reviewer for ACM Transactions on Embedded Computing Systems (TECS 2015)
- Reviewer for IEEE Journal of Selected Topics in Signal Processing 2014
- Reviewer for Transactions on Emerging Telecommunications Technologies 2014
- "Free and Open Source VLSI CAD Tools" at Jawaharlal Nehru University, Delhi [<http://freed.in>]
- "Icarus Verilog and Free/Open Source EDA Tools" at Indian Institute of Technology Madras.
- "Hybrid Electric Vehicle - with Intelligent Drive Switching" at IIT Bombay [Techfest 2004]
- Organized and conducted workshops for School/College students on 'Developing Leadership Qualities' as the head of the technical division of 'PEOPLE FIRST', a youth organization.
- Developer and maintainer of GNUSim8085, a 8085 simulator. [<http://gnusim8085.sourceforge.net>]
- RTEMS Contributor <http://www.rtems.com>
- Active Participation in Linux demo Days Conducted by the Chennai Linux users Group in creating Awareness on FLOSS to students in both the semi-urban and urban areas.

## Computer skills

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**Programming Languages:** C, Verilog, VHDL, Matlab, Bash, Python, L<sup>A</sup>T<sub>E</sub>X

**Tools and Platforms:** NEC V850 Emulators, Cadence and Synopsys toolchains, Software Defined Radio platforms, Xilinx and Altera FPGA platforms.

## **Awards**

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**Young Scientist Award:** awarded by the Indian Science Monitor in 2005

**Distinguished Alumni Award:** SSN Institutions, Chennai, India

## **Languages**

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**English, Tamil (Mother tongue):** Fluent

**German, Hindi:** Intermediate

**French, Hungarian:** Basic