Everton de Matos, Ph.D.

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Summary

- **Lead Security Research Engineer** at *Technology Innovation Institute*, United Arab Emirates, in the Secure Systems Research Center department. Experience on virtualization for *Embedded Systems*, actively involved in researching the *seL4 Microkernel* for both *ARM* and *RISC-V* platforms.
- **Ph.D. in Computer Science** from the Pontifical Catholic University of Rio Grande do Sul (PUCRS). Awarded a *Fulbright* scholarship to develop part of the doctoral dissertation at the University of Southern California (USC). Has several publications in important conferences and journals. Areas of interest are *embedded systems*, *information security*, *Internet of Things*, and *virtualization*.

Experience

Technology Innovation Institute — Abu Dhabi, United Arab Emirates

- *Senior Security Research Engineer* — *Aug 2020 - Mar 2023*
  Lead Security Research Engineer — *Apr 2023 - Current*
  - **Research and Development**:
    - Research in Embedded Systems security and confidential computing for both ARM and RISC-V platforms.
    - Implementation and deployment of virtualization solutions using seL4 microkernel and hypervisor on ARM platform.
    - Bring-ups, OS support, feature set support, device virtualization, kernel modules.
    - Proof-of-concept development of new solutions to improve the security of embedded devices.
    - Supervise international projects sponsored by the company at highly prestigious universities around the world (e.g., UNSW, Purdue, and Imperial College).
    - Write scientific papers and technical reports, and organize and present research outcomes to higher management and a broader external audience.

- **ATITUS** — Passo Fundo, Brazil
  Adjunct Professor — *Feb 2018 - Aug 2020*
  - **Teaching and Research**:
    - Delivered Computer Science lectures, administered assessments, and provided mentorship, staying current with industry trends to ensure a relevant curriculum.
    - Guided students through independent and group research projects, facilitated workshops on research methodologies, and collaborated with faculty on various research initiatives.

- **University of Southern California** — Los Angeles, CA
  Visiting Researcher — *Aug 2018 - May 2019*
  - **Research**:
    - Holder of a Doctoral Dissertation Research Award (DDRA) grant by the Fulbright Brazil Commission.
    - Research in the Internet of Things area, blockchain, IoT marketplaces, and context-drive decisions.
    - Written scientific papers and technical reports.

- **Pontifical Catholic University of Rio Grande do Sul** — Porto Alegre, Brazil
  Researcher — *Mar 2014 - Mar 2020*
  - **Research**:
    - Research in Embedded Systems focusing on the context-awareness and security aspects of the Internet of Things.
    - Research in Context Sharing that is an essential requirement to have a common context information definition for heterogeneous IoT entities.
    - Development of a Context Sharing framework for IoT environments.
    - Design, development, and validation of a system to address the research challenge regarding context-awareness in IoT.
    - Written scientific papers and technical reports.

Education

- **Pontifical Catholic University of Rio Grande do Sul** — Porto Alegre, Brazil
  PhD in Computer Science — *Mar 2016 - Mar 2020*
  Doctorate's dissertation: "Edge-centric context sharing architecture for the internet of things: context interoperability and context-aware security"

- **Pontifical Catholic University of Rio Grande do Sul** — Porto Alegre, Brazil
  MSc in Computer Science — *Mar 2014 - Mar 2016*
  Master's thesis: "Context-aware information services provision for IoT environments".

- **University of Passo Fundo** — Passo Fundo, Brazil
  BSc in Computer Science — *Feb 2010 - Jan 2014*
  Final project: "Development of a low-cost prototype to measure body balance".

Skills Summary

- **Languages**: C, C++, Unix scripting, Python, Assembly
- **Tools**: seL4, KVM, Docker, Linux, U-Boot, GIT, JIRA, Confluence
- **Platforms**: ARM, RISC-V

Awards and Honors

- **2020**: Approved with honor at the PhD in Computer Science - Pontifical Catholic University of Rio Grande do Sul
- **2018**: Doctoral Dissertation Research Award Scholarship - Fulbright
- **2016**: Approved with honor at the MSc in Computer Science - Pontifical Catholic University of Rio Grande do Sul
- **2015**: Finalist (among 10 best) in the contest of best Masters Thesis in Computer Science of Brazilian Computer Society

Publications

- Total of 6 Journals publications, 23 Conferences publications, and 3 book chapters. With +510 citations and h-index of 12. The complete list of publications is available at Google Scholar.
- The most recent publications considering the last 5 years:

- **Journals**:
  - Matos, E.D. and Ahvenjärvi, M., 2022. seL4 Microkernel for virtualization use-cases: Potential directions towards a standard VMM. Electronics, 11(24), p.4201. https://doi.org/10.3390/electronics11244201
  - Tiburski, R.T., Moratelli, C.R., Johann, S.F., de Matos, E. and Hessel, F., 2021. A lightweight virtualization model to enable edge computing in deeply embedded systems. Software: Practice and Experience, 51(9), pp.1964-1981. https://doi.org/10.1002/spe.2968
  - de Matos, E., Tiburski, R.T., Moratelli, C.R., Johann Filho, S., Amaral, L.A., Ramachandran, G., Krishnamachari, B. and Hessel, F., 2020. Context information sharing for the Internet of Things: A survey. Computer Networks, 166, p.106988. https://doi.org/10.1016/j.comnet.2019.106988
  - Tiburski, R.T., Moratelli, C.R., Johann, S.F., Neves, M.V., de Matos, E., Amaral, L.A. and Hessel, F., 2019. Lightweight security architecture based on embedded virtualization and trust mechanisms for IoT edge devices. IEEE Communications Magazine, 57(2), pp.67-73. https://doi.org/10.1109/MCOM.2018.1701047

- **Conferences**:
  - de Matos, E., Viegas E. and Hessel, F., 2023, March. Context-Aware Security in the Internet of Things: A Review. In 2020 37th International Conference on Advanced Information Networking and Applications (AINA-2023) (pp. 518-531). Springer. https://doi.org/10.1007/978-3-031-28694-0_49
  - Viegas, E.K., de Matos, E., de Oliveira, P.R. and Santin, A.O., 2023, March. A Dynamic Machine Learning Scheme for Reliable Network-Based Intrusion Detection. In 2020 37th International Conference on Advanced Information Networking and Applications (AINA-2023) (pp. 439-451). Springer. https://doi.org/10.1007/978-3-031-28451-9_39
  - de Matos, E., Tiburski, R.T. and Hessel, F., 2022, December. ConShar: An Edge-based Context Sharing Model for the Internet of Things. In 2022 IEEE 8th World Forum on Internet of Things (WF-IoT) (pp. 1-6). IEEE. https://doi.org/10.1109/WF-IoT54382.2022.10152096
  - Moratelli, C.R., Tiburski, R.T., Johann, S.F., Moura, E., de Matos, E. and Hessel, F., 2022, December. MIPS and RISC-V: Evaluating Virtualization Trade-off for Edge Devices. In 2022 IEEE 8th World Forum on Internet of Things (WF-IoT) (pp. 1-6). IEEE. https://doi.org/10.1109/WF-IoT54382.2022.10152084
  - Kyusuk, H., Al Blooshi, S., Alnuaimi, N., Al Nuaimi, E., de Matos, E. and Psiakis, R., 2022, December. Improving Drone Mission Continuity in Rescue Operations with Secure and Efficient Task Migration. In 2022 IEEE 8th World Forum on Internet of Things (WF-IoT) (pp. 1-6). IEEE. https://doi.org/10.1109/WF-IoT54382.2022.10152279
  - Portal, G., de Matos, E. and Hessel, F., 2020, June. An edge decentralized security architecture for industrial iot applications. In 2020 IEEE 6th World Forum on Internet of Things (WF-IoT) (pp. 1-6). IEEE. https://doi.org/10.1109/WF-IoT48130.2020.9221176
  - Tiburski, R.T., de Matos, E. and Hessel, F., 2019, April. Evaluating the DTLS Protocol from CoAP in Fog-to-Fog Communications. In 2019 IEEE International Conference on Service-Oriented System Engineering (SOSE) (pp. 90-905). IEEE. https://doi.org/10.1109/SOSE.2019.00022
  - de Matos, E., Tiburski, R.T., Amaral, L.A. and Hessel, F., 2018, August. Providing context-aware security for IoT environments through context sharing feature. In 2018 17th IEEE international conference on trust, security and privacy in computing and communications/12th IEEE international conference on big data science and engineering (TrustCom/BigDataSE) (pp. 1711-1715). IEEE. https://doi.org/10.1109/TrustCom/BigDataSE.2018.00257
  - de Matos, E., Tiburski, R.T., Amaral, L.A. and Hessel, F., 2018, June. Context interoperability for IoT through an edge-centric context sharing architecture. In 2018 IEEE Symposium on Computers and Communications (ISCC) (pp. 00667-00670). IEEE. https://doi.org/10.1109/ISCC.2018.8538491

- **Book Chapters**:
  - Moratelli, C.R., Tiburski, R.T., de Matos, E., Portal, G., Johann, S.F. and Hessel, F., 2020. Privacy and security of Internet of Things devices. In Real-Time Data Analytics for Large Scale Sensor Data (pp. 183-214). Academic Press. https://doi.org/10.1016/B978-0-12-818014-3.00009-7