MARKO RISTIC

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EDUCATION

- Doctoral Studies in Computer Science (2021 – present) Otto von Guericke University, Magdeburg, Germany *(topic: Data Confidentiality for Distributed Sensor Fusion)*
- Commencement of Doctoral Studies in Computer Science (2019 – 2021) Karlsruhe Institute of Technology, Karlsruhe, Germany *(topic: Privacy-preserving state estimation in distributed environments)*
- Master of Engineering (with Distinction) in Software (2017 – 2018) University of Melbourne, Melbourne, Australia *(electives include: AI Planning, Machine Learning, Parallel and Multi-Core Computing, Modelling Complex Systems)*, WAM: 83.00
- Bachelor of Science with Major in Computing and Software Systems (2013 – 2015) University of Melbourne, Melbourne, Australia *(electives include: Statistics, Probability, Artificial Intelligence, Computer Systems, Software Modelling and Design)*, WAM: 79.87
- Victorian Certification of Education (2007 – 2012) University High School, Melbourne, Australia, ATAR: 92.3

TECHNICAL EXPERIENCE

- Recent research topics: Privacy in state estimation, Cryptographically provable differences in estimation, Data confidentiality in distributed fusion
- Languages: C, Python, LaTeX, Java, C#, Haskell, Ada, SQL, JavaScript, HTML/CSS
- Modelling languages: PDDL, FSP, Alloy
- Frameworks: Unity, ASP.NET, N-hibernate, Kendo UI
- Planned, worked with and researched in industry-research partnership projects
- Participated and lead in Agile software development environments
- Designed, reviewed and revised quality assurance processes

WORK EXPERIENCE AND STUDENT WORK

Scientific Researcher and PhD Candidate, OVGU **APR 2021 – PRESENT**

After establishing a common research interest with my previous PhD supervisor, Prof. Dr-Ing. Benjamin Noack, and with his new professorship at the Otto von Guericke University (OVGU), Germany, I continued my previous research work at OVGU. I have focused on the field of data confidentiality for state estimation in distributed environments, geared towards the context of autonomous vehicle state estimation and decentralised localisation. During this time, I supervised student theses and performed various teaching duties.

Scientific Researcher and PhD Candidate, KIT **AUG 2019 – MAR 2021**

I commenced my doctoral studies at the Intelligent Sensor-Actuator-Systems (ISAS) Laboratory at the Karlsruhe Institute of Technology (KIT), Germany. Here, I participated in student supervision and industry project correspondence. My research topic was the application of cryptographic techniques to provide privacy-preserving state estimation, including localisation and data fusion, in distributed and decentralised environments. The nature of this mathematically oriented research topic allowed to me to further develop my technical and theoretical skills, while making use of my strong practical background.

Research Officer, CSIRO Collaborative Crystallisation Centre **JUN 2014 – JUL 2019**

I began work at CSIRO's Collaborative Crystallisation Centre (C3) as an Undergraduate Research Opportunity Program (UROP) scholar. My UROP project focused on the relationships between protein melt curves, protein stability and crystallisation conditions. After the UROP project's conclusion I was offered a position at C3 to design, write, and maintain lab software. This has given me invaluable experience in a research environment, as well as technical experience in software design, mobile application design/implementation, and understanding of software quality protocols.

Research Assistant, IIT-K India Summer Research Program **DEC 2015 – FEB 2016**

For two months I studied at the Indian Institute of Technology, Kanpur (IITK) working under Professor Sandeep Shukla, focusing primarily on cryptography and cyber-security.

PEER REVIEWED PUBLICATIONS

1. **Ristic M**, Noack B, Hanebeck UD (2023) *Distributed Range-Only Localisation that Preserves Sensor and Navigator Privacies* IEEE Transactions on Automatic Control, 1-12 doi: 10.1109/TAC.2023.3263740
2. **Ristic M**, Noack B (2022) *Privileged Estimate Fusion With Correlated Gaussian Keystreams* IEEE International Conference on Decision and Control, 7732-7739 doi: 10.1109/CDC51059.2022.9993240

3. **Ristic M**, Noack B (2022) *Encrypted Fast Covariance Intersection Without Leaking Fusion Weights* IEEE International Conference on Multisensor Fusion and Integration, 1-6 doi: 10.1109/MFI55806.2022.9913840
4. **Ristic M**, Noack B, Hanebeck UD (2022) *Cryptographically Privileged State Estimation with Gaussian Keystreams* IEEE Control Systems Letters **6(1)**, 602-607 doi: 10.1109/LCSYS.2021.3084405
5. **Ristic M**, Noack B, Hanebeck UD (2021) *Secure Fast Covariance Intersection Using Partially Homomorphic and Order Revealing Encryption Schemes* IEEE Control Systems Letters **5(1)**, 217-222 doi: 10.1109/LCSYS.2020.3000649
6. Wilson J, **Ristic M**, Kirkwood J, Hargreaves D, Newman J (2020) *Predicting the effect of chemical factors on the pH of crystallisation trials* Iscience **23(6)**, 101219 doi: 10.1016/j.isci.2020.101219
7. Rosa N, **Ristic M**, Thorburn L, Abrahams GJ, Marshall B, Watkins CJ, Kruger A, Khassapov A, Newman J (2020) *Tools to Ease the Choice and Design of Protein Crystallisation Experiments* Crystals **10(2)**, 95 doi: 10.3390/cryst10020095
8. Watkins CJ, Rosa N, Carroll T, Ratcliffe D, **Ristic M**, Russell C, Li R, Fazio V (2019) *A Crystal/Clear Pipeline for Applied Image Processing* Asian Conference on Supercomputing Frontiers **11416**, 19-37 doi: 10.1007/978-3-030-18645-6_2
9. Rosa N, **Ristic M**, Marshall B, Newman J (2018) *Cinder: Keeping crystallographers App-y* Acta Crystallographica **F74**, 410-418 doi: 10.1107/S2053230X18008038
10. Gu A, Marshall B, Rosa N, **Ristic M**, Newman J (2018) *Organizing a Crystallization Laboratory* Journal of Applied Crystallography **51(1)**, 47-54 doi: 10.1107/S1600576717016727
11. **Ristic M**, Rosa N, Seabrook SA, Newman J (2015) *Formulation screening by Differential Scanning Fluorimetry - how often does it work?* Acta Crystallographica **F71**, 1359-1364 doi: 10.1107/S2053230X15012662
12. Rosa N, **Ristic M**, Seabrook SA, Lovell D, Lucent D, Newman J (2015) *Meltdown – a tool to help in the interpretation of thermal melt curves acquired by Differential Scanning Fluorimetry* Journal of Biomolecular Screening **20(7)**, 898-905 doi: 10.1177/1087057115584059
13. Jayne M, **Ristic M**, Rosa N, Seabrook SA, Newman J, Lovell D, Lucent D (2015) *Meltdown – a tool for classification and Analysis of DSF Data* Biophysical Journal **108(2)**, 519, doi: 10.1016/j.bpj.2014.11.2845

PRESENTATIONS

- Contributed Talk – 61st Conference on Decision and Control (CDC-2022), 2022 (Cancún, Mexico)
- Contributed Talk - 60th Conference on Decision and Control (CDC-2021), 2021 (Virtual)
- Contributed Talk - 59th Conference on Decision and Control (CDC-2020), 2020 (Virtual)
- Contributed Talk - 16th International Conference on the Crystallization of Biological Macromolecules (ICCBM-16), 2016 (Prague, Czech Republic)

DEVELOPED PUBLIC SOFTWARE

- **Meltdown** - Software for the analysis and summary of protein melt curve data (GitHub).
- **Cinder** - Software for crystallisation image categorisation and AI data set building (Google Play, Apple Store).
- **pHeuristic** - Lab software for measuring and verifying crystallisation screen condition pH, used for quality control purposes. (available on request from C3)

REFERENCES

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