

Mahdi Sedaghat | Jan 2024

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EDUCATION

KU Leuven <i>Ph.D. Student at COSIC</i> Privacy-Preserving Primitives in Distributed Systems, Supervisor: Prof. Bart Preneel	Leuven, Belgium <i>Jan 2020-Present</i>
Sharif University of Technology <i>Master of Secure Telecommunication and Cryptography</i> Attribute-Based Encryption, Supervisors: Prof. MR Aref & Prof. Javad Mohajeri	Tehran, Iran <i>Sept 2015- Sept 2017</i>

EXPERIENCE

Department of Information Engineering, CUHK <i>Visiting Researcher, hosted by Prof. Sherman S. M. Chow</i>	Hong Kong <i>Dec 2023</i>
Mysten Labs. <i>Research Scientist, Internship, Crypto team</i>	Remote <i>Apr 2023 - Aug 2023</i>
School of Informatics, University of Edinburgh <i>Visiting Researcher, hosted by Prof. Markulf Kohlweiss</i>	Edinburgh, UK <i>Feb 2023 - Apr 2023</i>
Computer Science Institute at Charles University <i>Visiting Researcher, hosted by Prof. Pavel Hubáček</i>	Prague, Czech Republic <i>Jan 2019 - Jan 2020</i>
Information Systems and Security Lab. (ISSL), SUT <i>Research Assistant</i>	Tehran, Iran <i>Sept 2017 - Dec 2018</i>

OPEN SOURCE PROJECTS

• Unlinkable Policy-Compliant Signatures <i>Prototyping the PCS and several implementations for ul-PCS schemes.</i>	Python, Docker 
• Groth-Sahai Proofs <i>An efficient implementation for the seminal work of Jens Groth and Amit Sahai proof system.</i>	Python 
• Nirvana Payment <i>A distributed implementation of an anonymous and reusable payment guarantee system.</i>	Python 
• Cross-Domain Attribute-Based Access Control Encryption (CD-ABACE) <i>Proof of concept for the cross-domain access control encryption scheme.</i>	Python 

COMPUTER SKILLS

- **Electronic and digital processing:** Proteus, Codevision (AVR Programming), MATLAB (Programming & Simulink).
- **Programming:** C, C++, Linux/Unix Programming, Latex, Python, Solidity, Sage, GoLang, Rust.
- **General:** Microsoft Office, Visio, MS Project, Photoshop, Davinci Resolve.

TEACHING

- **Internship mentoring:** Anonymous Credentials, Student: Peter Schwarz, COSIC, KU Leuven (2023).
- **Lecturer** in Privacy course on Anonymous Credential systems, COSIC, KU Leuven (2022-2023).
- **Mentoring** in CyberSecurity Basics course, COSIC, KU Leuven (2022-2023 & 2023-2024).
- **Internship mentoring:** Decentralized e-Voting systems, Student: Sermin Kocaman, COSIC, KU Leuven (2022).
- **Master's Thesis Supervision:** Privacy assessment of current business practices using blockchains in banking and financial sector, Jowhar Ding, COSIC, KU Leuven (2020-2021).




PROFESSIONAL SERVICE

I have served on the **PKC-2024, IEEE TDSC-2024, LatinCrypt-2023, ACM CCS-2023, IEEE TDSC-2023, IEEE TIFS-2022, EC-2022, AC-2020, TCC-2019** and **ISCISC-2018** as reviewer.

AWARDS AND ACHIEVEMENTS

- The best proposal for the Virtual design challenge for authentication and protecting Full Motion Video system, University of British Columbia, Canada, 2019 [Link](#).
- Ranked 46th in M.Sc. national university entrance exam in Communications branch among about 20,000 participants, 2015.
- Ranked 36th in Iranian National Olympiad in Electrical Engineering among all bachelor students of Electrical Engineering, 2014.
- Ranked 3rd/38 in bachelor students of Electrical Engineering, 2014.

EXTRA

- Blogpost, Groth-Sahai Proofs: Zero to Hero. 
- Research scientist in the ZkLogin project: A Privacy-Preserving Blockchain Authentication with Existing Credentials (Coming up soon). 
- Technical consultant in the Groth'16 Ceremonial Setup for zkLogin project at Mysten Labs. 

LANGUAGES and PERSONAL DETAILS

- Persian: Native Language.
- English: Fluent.
- Dutch: Basic.
- Nationality: Iranian.

TALKS

- Unlinkable Policy-Compliant Signatures for Compliant and Decentralized Anonymous Payments, CUHK, Hong Kong, 12 Dec 2023. [link](#)
- Threshold Structure-Preserving Signatures, Asiacrypt, Guangzhou, China, 6 Dec 2023. [link](#)
- Trusted Setups for zkSNARKs, Mysten Labs Paris offsite, 4 August 2023.
- Unlinkable Policy-Compliant Signatures, Blockchain Technology Lab (BTL), Edinburgh, 20 March 2023.
- Cross-Domain Attribute-Based Access Control Encryption, CANS'21, Online, 13 December 2021.

Publications

PEER-REVIEWED:

Katerina Mitrokotsa, Sayantan Mukherjee, Mahdi Sedaghat, Daniel Slamanig, and Jenit Tomy. Threshold Structure-Preserving Signatures: Strong and Adaptive Security under Standard Assumptions. 2024. To appear at PKC'24.

Foteini Baldimtsi, Konstantinos Kryptos Chalkias, Francois Garillot, Jonas Lindstrom, Ben Riva, Arnab Roy, Mahdi Sedaghat, Alberto Sonnino, Pun Waiwitlikhit, and Joy Wang. Subset-optimized BLS Multi-Signature with Key Aggregation. Cryptology ePrint Archive, Paper 2023/498 (To appear at Financial Crypto 2024), 2023. <https://eprint.iacr.org/2023/498>.

Elizabeth Crites, Markulf Kohlweiss, Bart Preneel, Mahdi Sedaghat, and Daniel Slamanig. Threshold Structure-Preserving Signatures. In *International Conference on the Theory and Application of Cryptology and Information Security (ASIACRYPT)*, pages 348–382. Springer, 2023. <https://eprint.iacr.org/2022/839>.

Karim Bagheri, Axel Mertens, and Mahdi Sedaghat. Benchmarking the Setup of Updatable Zk-SNARKs. In *Progress in Cryptology – LATINCRYPT 2023*, pages 375–396, Cham, 2023. Springer Nature Switzerland. <https://eprint.iacr.org/2023/1161>.

Akash Madhusudan, Mahdi Sedaghat, Samarth Tiwari, Kelong Cong, and Bart Preneel. Reusable, Instant and Private Payment Guarantees for Cryptocurrencies. In *Information Security and Privacy - 28th Australasian Conference, ACISP 2023, Brisbane, QLD, Australia, July 5-7, 2023, Proceedings*, volume 13915 of *Lecture Notes in Computer Science*, pages 580–605. Springer, 2023. <https://eprint.iacr.org/2023/583>.

Seyed Farhad Aghili, Mahdi Sedaghat, Dave Singelee, and Maanak Gupta. MLS-ABAC: Efficient Multi-Level Security Attribute-Based Access Control scheme. *Future Generation Computer Systems*, 2022. <https://www.sciencedirect.com/science/article/pii/S0167739X22000115>.

Karim Bagheri and Mahdi Sedaghat. Tiramisu: Black-Box Simulation Extractable NIZKs in the Updatable CRS Model. In *Cryptology and Network Security (CANS)*, pages 531–551, Cham, 2021. Springer International Publishing. <https://eprint.iacr.org/2020/474>.

Mahdi Sedaghat and Bart Preneel. Cross-Domain Attribute-Based Access Control Encryption. In *Cryptology and Network Security (CANS)*, pages 3–23. Springer International Publishing, 2021. <https://eprint.iacr.org/2021/074>.

UNDER-REVIEW:

Foteini Baldimtsi, Konstantinos Kryptos Chalkias, Yan Ji, Jonas Lindstrøm, Deepak Maram, Ben Riva, Arnab Roy, Mahdi Sedaghat, and Joy Wang. zkLogin: Privacy-Preserving Blockchain Authentication with Existing Credentials. *arXiv preprint*, 2024. <https://arxiv.org/pdf/2401.11735>.

Christian Badertscher, Mahdi Sedaghat, and Hendrik Waldner. Fine-Grained Accountable Privacy via Unlinkable Policy-Compliant Signatures. Cryptology ePrint Archive, Paper 2023/1070, 2023. <https://eprint.iacr.org/2023/1070>.

Akash Madhusudan, Mahdi Sedaghat, Philipp Jovanovic, and Bart Preneel. Nirvana: Instant and Anonymous Payment-Guarantees. Cryptology ePrint Archive, Paper 2022/872, 2022. <https://eprint.iacr.org/2022/872>.

Omid Mirzamohammadi, Mahdi Sedaghat, Emad Heydari Beni, Aysajan Abidin, and Dave Singelee. Structure-Preserving MACs on Equivalence-Classes: Application to Privacy-Preserving Identification Protocols. 2024.