

Igors Stepanovs

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EDUCATION

- 09/2013 – 12/2019 **PhD in Computer Science**
University of California, San Diego (San Diego, USA).
Advisor: Prof. Mihir Bellare.
- 09/2011 – 09/2012 **MSc in Mathematics of Cryptography and Communications**
Royal Holloway, University of London (Egham, United Kingdom).
Pass with distinction (final average: 81.88/100).
- 08/2010 – 07/2012 **MSc and BSc in Computer Science**
09/2006 – 07/2010 University of Latvia (Riga, Latvia).
Diplomas with distinction (weighed average grades: 9.475/10 and 9.337/10).

EMPLOYMENT

- 05/2024 – present **Applied Scientist** (09/2024 – present)
Software Development Engineer (05/2024 – 08/2024)
Amazon (Madrid, Spain).
- 02/2020 – 09/2021 **Postdoctoral Researcher**
ETH Zürich (Zürich, Switzerland).
Worked in the Applied Cryptography Group led by Prof. Kenneth G. Paterson.
- 09/2012 – 09/2013 **Programmer**
08/2010 – 09/2011 whiteCryption (Riga, Latvia).
Performed research and development of whitebox cryptography library **SecureKeyBox**. Wrote custom implementations of various cryptographic primitives in **C++** to leverage auxiliary instructions of an in-house source-code protection technology **MCFACT** (providing an interface to a virtual whitebox machine). Explored the feasibility of using fully homomorphic encryption (**FHE**), i.e. implemented an **FHE** scheme in **Sage**, and then implemented **AES** to use an **FHE**-encrypted secret key. In the early stages of the project, concurrently performed other roles: release engineering, communication with prospective customers.
Primarily worked with: C++, Sage, Python.
- 02/2009 – 08/2010 **System Analyst / Developer**
DnB Nord Bank (Riga, Latvia).
Worked in the Core Banking team. Developed a tool in **Java** to parse and modify **XML** and **XSD** files.
Primarily worked with: OpenEdge Advanced Business Language, Java.
- 07/2007 – 01/2009 **Programmer**
Syncrosoft (Riga, Latvia).
Built an ad-hoc **C++** refactoring tool based on **Yacc/Bison**. Then repurposed the open-source parser **Elsa** to (instead) refactor **C++** code by traversing its abstract syntax tree. Used it to automate the application of an in-house source-code protection technology **MCFACT** on demarcated blocks of **C++** code.
Primarily worked with: C++.
- 09/2012 – 05/2013 **Programming Teacher**
02/2007 – 02/2010 Progmeistars (Riga, Latvia).
(part-time job) Taught programming to groups of high school students. Developed lectures and lab exercises. Covered a range of topics across different semesters, including binary arithmetic, **SQL** databases, dynamic memory allocation in **Pascal**, pointer-based data structures, recursion, and combinatorial algorithms.

PROGRAMMING COMPETITIONS

- 09/2013 – 06/2017 Organized the selection and preparation of UC San Diego teams for the regional contest of ACM ICPC.
- 09/2006 – 06/2010 Represented University of Latvia in (sub)regional contests of ACM ICPC.
- 08/2006 18th International Olympiad in Informatics (IOI 2006) – bronze medal.
- 08/2005 17th International Olympiad in Informatics (IOI 2005) – silver medal.
- 05/2006 12th Baltic Olympiad in Informatics (BOI 2006) – bronze medal.
- 05/2005 11th Baltic Olympiad in Informatics (BOI 2005) – silver medal.
- 04/2004 10th Baltic Olympiad in Informatics (BOI 2004) – bronze medal.

PUBLICATIONS

- [1] M. R. Albrecht, L. Mareková, K. G. Paterson, E. Ronen, and I. Stepanovs. “**Analysis of the Telegram Key Exchange**”. In: *EUROCRYPT 2025, Part VIII*. Vol. 15608. LNCS. May 2025.
- [2] J. Jaeger, A. Kumar, and I. Stepanovs. “**Symmetric Signcryption and E2EE Group Messaging in Keybase**”. In: *EUROCRYPT 2024, Part III*. Vol. 14653. LNCS. May 2024.
- [3] M. R. Albrecht, L. Mareková, K. G. Paterson, and I. Stepanovs. “**Four Attacks and a Proof for Telegram**”. In: *2022 IEEE Symposium on Security and Privacy*. May 2022. Distinguished Paper Award.
- [4] M. Bellare and I. Stepanovs. “**Security Under Message-Derived Keys: Signcryption in iMessage**”. In: *EUROCRYPT 2020, Part III*. Vol. 12107. LNCS. May 2020.
- [5] M. Drijvers, K. Edalatnejad, B. Ford, E. Kiltz, J. Loss, G. Neven, and I. Stepanovs. “**On the Security of Two-Round Multi-Signatures**”. In: *2019 IEEE Symposium on Security and Privacy*. May 2019.
- [6] J. Jaeger and I. Stepanovs. “**Optimal Channel Security Against Fine-Grained State Compromise: The Safety of Messaging**”. In: *CRYPTO 2018, Part I*. Vol. 10991. LNCS. Aug. 2018.
- [7] M. Bellare, A. O’Neill, and I. Stepanovs. “**Forward-Security Under Continual Leakage**”. In: *CANS 17*. Vol. 11261. LNCS. Nov. 2017.
- [8] M. Bellare, A. C. Singh, J. Jaeger, M. Nyayapati, and I. Stepanovs. “**Ratcheted Encryption and Key Exchange: The Security of Messaging**”. In: *CRYPTO 2017, Part III*. Vol. 10403. LNCS. Aug. 2017.
- [9] M. Bellare, I. Stepanovs, and B. Waters. “**New Negative Results on Differing-Inputs Obfuscation**”. In: *EUROCRYPT 2016, Part II*. Vol. 9666. LNCS. May 2016.
- [10] M. Bellare and I. Stepanovs. “**Point-Function Obfuscation: A Framework and Generic Constructions**”. In: *TCC 2016-A, Part II*. Vol. 9563. LNCS. Jan. 2016.
- [11] M. Bellare, I. Stepanovs, and S. Tessaro. “**Contention in Cryptoland: Obfuscation, Leakage and UCE**”. In: *TCC 2016-A, Part II*. Vol. 9563. LNCS. Jan. 2016.
- [12] M. Bellare, I. Stepanovs, and S. Tessaro. “**Poly-Many Hardcore Bits for Any One-Way Function and a Framework for Differing-Inputs Obfuscation**”. In: *ASIACRYPT 2014, Part II*. Vol. 8874. LNCS. Dec. 2014.

FURTHER INFORMATION

My web page provides the full information about my teaching experience, academic service, advising, and talks.