

# ORESTIS MELKONIAN

## PERSONAL DATA

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PLACE | DATE OF BIRTH: Athens, Greece | December 1992  
EMAIL: [melkon.or@gmail.com](mailto:melkon.or@gmail.com)  
WEBSITE: [omelkonian.github.io](https://omelkonian.github.io)

## EDUCATION

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- SEP 2019 - SEP 2023 PhD in COMPUTER SCIENCE @ **University of Edinburgh**, Scotland  
*Institute:* Laboratory for Foundations of Computer Science (LFCS)  
*Supervisor:* Philip Wadler  
*Thesis:* Verified Compilation from BitML to Bitcoin: An Agda Odyssey
- SEP 2017 - JUL 2019 M.Sc. in COMPUTING SCIENCE @ **Utrecht University**, The Netherlands  
*GPA:* 8.99/10 (*cum laude*)  
*Specialization:* Programming Technology  
*Supervisors:* Wouter Swierstra (UU), Manuel M.T. Chakravarty (IOHK)  
*Thesis:* Formalizing Extended UTxO and BitML Calculus in Agda
- OCT 2010 - APR 2016 B.Sc. in COMPUTER SCIENCE @ **National and Kapodistrian University of Athens**, Greece  
*GPA:* 8.6/10 (*distinction*)  
*Specializations:* Knowledge and Data Management, Software  
*Supervisors:* Panos Rondogiannis, Angelos Charalambidis  
*Thesis:* RHEA - A Reactive, Heterogeneous, Extensible and Abstract Framework for Dataflow Programming
- FEB 2014 - Jul 2014 Erasmus exchange student in COMPUTER SCIENCE  
**Universita della Svizzera Italiana**, Lugano, Switzerland  
*Coordinators:* Ioannis Emiris, Marc Langheinrich

## WORK EXPERIENCE

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- SEP 2023 - JAN 2024 Formal Methods Intern @ **Input Output (IOG)**  
*Working on the Agda formalisation of the Cardano ledger*  
*Supervisor:* James Chapman
- FEB 2021 - MAR 2023 Haskell Reviewer (part-time) @ **MigaMake**, Singapore  
*Reviewing code, technical reports, and scientific articles*  
*Supervisor:* Michal Gajda
- JAN 2019 - JUL 2019 Haskell Developer (part-time) @ **QBayLogic**, The Netherlands  
*Implemented a GUI to inspect optimization steps in the Clash compiler*  
*Supervisor:* Christiaan Baaij
- DEC 2017 - DEC 2018 Haskell Developer (part-time) @ **Utrecht University**, The Netherlands  
*FORMALZ: A tower-defence game for learning Hoare-style specifications*  
*Developed the SMT-based checker between teacher and student formulas*  
*Supervisor:* Wishnu Prasetya
- JUN 2017 - AUG 2017 Research Intern @ **Max Planck Institute for Software Systems (MPI-SWS)**, Germany  
*Software Analysis & Verification Group*  
*Proof mechanization of a novel C/C++11 memory model in Coq*  
*Supervisor:* Viktor Vafeiadis
- MAY 2016 - MAY 2017 Technical Intern (*Backend Web Developer*) @ **CERN**, Switzerland  
*INVENIO project: Video workflows for the Cern Document Server (CDS)*  
*Supervisor:* Ludmila Marian
- OCT 2015 - APR 2016 Research Intern @ **National Center for Scientific Research "Demokritos"**, Athens, Greece  
*Software & Knowledge Engineering Laboratory (SKEL)*  
*Design and implementation of a dataflow framework for robotics*  
*Supervisor:* Angelos Charalambidis

## RESEARCH INTERESTS

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- Functional Programming
- Programming Languages, Semantics
- Type Systems, Formal Semantics
- Verification, Formal Methods
- Compilers, Static Analysis
- Category Theory
- Proof Theory, Theorem Provers
- Algorithmic Music

## PUBLICATIONS

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- TYPES '23    **Program logics for ledgers (Extended Abstract)**  
Orestis Melkonian, Wouter Swierstra, James Chapman  
*29<sup>th</sup> International Conference on Types for Proofs and Programs*
- TYPES '23    **Nominal techniques as an Agda library (Extended Abstract)**  
Murdoch J. Gabbay, Orestis Melkonian  
*29<sup>th</sup> International Conference on Types for Proofs and Programs*
- HASKELL '22 (ICFP)    **Reasonable Agda is correct Haskell: writing verified Haskell using AGDA2HS**  
Jesper Cockx, Orestis Melkonian, Lucas Escot, James Chapman, Ulf Norell  
*15<sup>th</sup> International Haskell Symposium. ACM*
- ISoLA '20    **UTXO<sub>ma</sub>: UTXO with Multi-Asset Support**  
M.Chakravarty, J.Chapman, K.MacKenzie, O.Melkonian, J.Müller, M.Jones, P.Vinogradova, P.Wadler  
*9<sup>th</sup> International Symposium On Leveraging Applications of Formal Methods, Verification and Validation*
- ISoLA '20    **Native Custom Tokens in the Extended UTXO Model**  
M.Chakravarty, J.Chapman, K.MacKenzie, O.Melkonian, J.Müller, M.Jones, P.Vinogradova, P.Wadler  
*9<sup>th</sup> International Symposium On Leveraging Applications of Formal Methods, Verification and Validation*
- ECOOP '20    **Reconciling Event Structures with Modern Multiprocessors**  
E.Moiseenko, A.Podkopaev, O.Lahav, O.Melkonian, V.Vafeiadis  
*34<sup>th</sup> European Conference on Object-Oriented Programming*
- WTSC'20 (FC)    **The Extended UTXO Model**  
M.Chakravarty, J.Chapman, K.MacKenzie, O.Melkonian, M.Jones, P.Wadler  
*4<sup>th</sup> Workshop on Trusted Smart Contracts*
- SRC'19 (ICFP)    **Formalizing BitML Calculus in Agda (Extended Abstract)**  
Orestis Melkonian  
*Student Research Competition, Poster Session*
- TyDE'19 (ICFP)    **Formal Investigation of the Extended UTxO Model (Extended Abstract)**  
Orestis Melkonian, Wouter Swierstra, Manuel M.T. Chakravarty  
*4<sup>rd</sup> ACM SIGPLAN International Workshop on Type-Driven Development. ACM*
- FARM'19 (ICFP)    **Music as Language: Putting Probabilistic Temporal Graph Grammars to Good Use**  
Orestis Melkonian  
*7<sup>th</sup> ACM SIGPLAN International Workshop on Functional Art, Music, Modeling, and Design. ACM*
- FARM'19 (ICFP)    **What Constitutes a Musical Pattern?**  
Orestis Melkonian, Iris Yuping Ren, Wouter Swierstra, Anja Volk  
*7<sup>th</sup> ACM SIGPLAN International Workshop on Functional Art, Music, Modeling, and Design. ACM*
- ICSE'19    **Having Fun in Learning Formal Specifications**  
Wishnu Prasetya, Craig Leek, Orestis Melkonian *et al.*  
*41<sup>th</sup> International Conference on Software Engineering: Software Engineering Education and Training. ACM*
- REBLS'18 (SPLASH)    **RHEA: A Reactive, Heterogeneous, Extensible and Abstract Framework for Dataflow Programming**  
Orestis Melkonian, Angelos Charalambidis  
*5<sup>th</sup> ACM SIGPLAN International Workshop on Reactive and Event-Based Languages and Systems. ACM*
- ESSLI'18    **D<sup>3</sup> as a 2-MCFL**  
Konstantinos Kogkalidis, Orestis Melkonian  
*Student Session of the 30<sup>th</sup> European Summer School in Logic, Language and Information. Springer*

## TEACHING EXPERIENCE

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- SEP 2020 - MAR 2021 **Reasoning & Agents** @ University of Edinburgh  
*Demonstrator & Marker*
- SEP 2019 - MAR 2020 **Types and Semantics for Programming Languages** @ University of Edinburgh  
*Teaching Assistant*
- SEP 2019 - MAR 2021 **Introduction to Computation: Functional Programming** @ University of Edinburgh  
*Teaching Assistant & Tutor & Marker*

## ACADEMIC SERVICE

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- JUNE 2023 Artifact Evaluation Committee @ **ICFP**: International Conference on Functional Programming, 2023
- FEB 2023 Artifact Evaluation Committee @ **ESOP**: European Symposium on Programming, 2023
- NOV 2022 Organiser @ **31<sup>st</sup> Agda Implementors' Meeting (AIM XXXI)**, Edinburgh, Scotland
- OCT 2022 Artifact Evaluation Committee @ **POPL**: Symposium on Principles of Programming Languages, 2023
- JUN 2022 Artifact Evaluation Committee @ **ICFP**: International Conference on Functional Programming, 2022
- MAR 2022 (Invited) Paper Reviewer @ **Post-TYPES** proceedings, 2022
- FEB 2022 Artifact Evaluation Committee @ **ESOP**: European Symposium on Programming, 2022
- JUL 2021 (Invited) Paper reviewer @ **APLAS**: Asian Symposium on Programming Languages and Systems, 2021
- AUG 2021 (Invited) Paper Reviewer @ **MSCS**: Mathematical Structures in Computer Science  
*special edition in memory of Martin Hofmann*

## AWARDS

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- JUN 2023 **EuroProofNet** Short-term Scientific Mission @ **Chalmers University of Technology**, Gothenburg, SE  
*Host: Jean-Philippe Bernardy*
- MAY 2023 **SICSA** Research Scholar Grant @ **36<sup>th</sup> Agda Implementors' Meeting (AIM XXXVI)**, Delft, NL
- JUN 2022 Travel Grant @ **Programming Language Mentoring Workshop (PLMW)**, PLDI, San Diego, US
- JUN 2019 Travel Grant @ **ZuriHac: A 3-day Haskell Hackathon**, Zurich, CH
- APR 2019 Travel Grant @ **School and Workshop on Univalent Mathematics**, Birmingham, UK
- AUG 2018 Registration Grant @ **European Summer School on Logic, Language & Information (ESSLI)**, Sofia, BG
- JUL 2018 Travel Grant @ **DeepSpec Summer School**, Princeton, US
- JUL 2017 Travel Grant @ **CAV Conference**, Heidelberg, DE
- JAN 2016 Travel Grant @ **Programming Language Mentoring Workshop (PLMW)**, POPL, Florida, US
- MAR 2016 Travel Grant @ **Meddays '16**, Sophia-Antipolis, FR

## LANGUAGES

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- GREEK: Native speaker
- ENGLISH: **Fluent**, *Certificate of Proficiency, University of Michigan*
- GERMAN: **Intermediate**, *Zertifikat B1, Goethe Institute*
- FRENCH: **Beginner**, *A2.1, Supercomm Suisse SA*

## EXTRA-CURRICULAR ACTIVITIES

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- Musical Instrument:** Electric jazz guitar (Intermediate)  
**RGT Grade 6** (*distinction*)  
*UWLQ Level 3 Certificate in Music Performance*  
University of West London  
*Examiner: Adam Moore BA(Hons), MMus, PGCE, FLCM*

(Algorithmic) Music Composition, Films, Philosophy, Literature, Traveling

## REFERENCES

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| <b>Philip Wadler</b><br>University of Edinburgh<br>✉ <a href="mailto:wadler@inf.ed.ac.uk">wadler@inf.ed.ac.uk</a> | <b>Wouter Swierstra</b><br>Utrecht University<br>✉ <a href="mailto:w.s.swierstra@uu.nl">w.s.swierstra@uu.nl</a> | <b>Manuel M.T. Chakravarty</b><br>IOHK<br>✉ <a href="mailto:manuel.chakravarty@iohk.io">manuel.chakravarty@iohk.io</a> | <b>Viktor Vafeiadis</b><br>MPI-SWS<br>✉ <a href="mailto:viktor@mpi-sws.org">viktor@mpi-sws.org</a> |
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*Last Updated: June 2023*