

# LIVIO POMPIANU, PHD

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Department of Mathematics and Computer Science  
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## EDUCATION

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**PhD in Computer Science** at University of Cagliari, Italy, **Nov. 2014 – Mar. 2018** Thesis: “Analysing blockchains and smart contracts: tools and techniques” | Advisor: M. Bartoletti

**MSc in Computer Science** at University of Cagliari, Italy, **Oct. 2012 – Sep. 2014** Final Mark: 109/110 GPA: 28.55/30 Thesis: “A contract-oriented middleware” | Advisor: M. Bartoletti

**BSc in Computer Science** at University of Cagliari, Italy, **Oct. 2009 - Jul. 2012** Final Mark: 110/110 *with honours* GPA: 27.95/30 Thesis: “Visual Engine for Reading On Network In Comprehensive Acceptation” | Advisor: M. Bartoletti

## RESEARCH ACTIVITY

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I started working as research assistant at the University of Cagliari in March 2014, during my MSc. Later, I continued my research activity first as a PhD student and then as a post-doc. I am a member of the research groups [Distributed Ledger Technology](#), [Blockchain@Unica](#), and [Trustworthy Computational Societies](#). I am *Cultore della materia* (Subject Expert) in Computer Science at my Department since 2020.

**Postdoc Researcher** at University of Cagliari. **Mar. 2018 – Current** The rise of blockchains has given a boost to several sectors. However, it is difficult to understand whether these technologies are applied correctly. My research systematically analyses blockchain applications measuring their impact among different sectors. The results were published at [WETSEB 2020](#), [GOODTECHS 2018](#) and led to the development of real blockchain based systems ([SCORE](#), [Sardcoin](#)) where I personally developed the blockchain software.

**Visiting PhD student** at University of Stirling, UK. **Feb. 2017 – May 2017** I coordinated a project involving my research group in the University of Cagliari and the research group of the University of Stirling. We studied and developed a general framework for blockchain analytics. My visit contributed to the development of a longer-term research collaboration on the topic between the Universities involved. The results were part of my PhD thesis and published at [SERIAL 2017](#).

**PhD Student** at University of Cagliari. **Sep. 2014 – Mar. 2018** Modern cryptocurrencies exploit decentralised blockchains to record a public and unalterable history of transactions. Besides transactions, further metadata is stored for different, and often undisclosed, purposes. My work investigates tools and techniques for analysing blockchains, their metadata, and smart contracts, focussing on Bitcoin and Ethereum. The results were part of my PhD thesis and published at [WTSC 2017](#), [BW 2017](#), [Grid Computing 2019](#).

**Postgraduate Researcher** at University of Cagliari. **Mar. 2014 – Sep. 2014** The main goal of my research was to exploit a theory of timed behavioural contracts to formalise, design and implement a message-oriented middleware where distributed services can be dynamically composed, and their interaction monitored to detect contract violations. The middleware was part of my MSc thesis and it was published at [FACS 2015](#).

## CONSULTANT AND DEVELOPER ACTIVITY

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I work as consultant for companies, designing and developing blockchain solutions. In my academic activity I develop open source research software.

**Blockchain Architect and Developer** of the [Sardcoin](#) project. **Oct. 2019 – Current** Sardcoin is a blockchain based couponing platform. I designed a blockchain solution (both nodes infrastructure and smart contracts) and developed it using Hyperledger Fabric.

**Blockchain Architect and Developer** of the [SCORE](#) project. **Jun. 2017 – Sep. 2019** SCORE is a blockchain based collaborative engineering platform. I designed a blockchain solution (both nodes infrastructure and smart contracts) and developed it using Hyperledger Fabric.

**Frontend developer** at [Xorovo](#), Cagliari. **Jul. 2012 – Sep. 2012** I worked as developer and tester using HTML, CSS, Javascript, JQuery.

**Author, developer, and maintainer of the open source projects**

- [BlockAPI](#) - A Scala library for the development of custom analytics on blockchains.
- [Contract-oriented middleware](#) - A Java middleware for contract-oriented applications.

## TEACHING ACTIVITY

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**Teaching assistant in academic courses** As teaching assistant at University of Cagliari I prepare my own material and conduct lectures. In all courses my work led to an increase in the final evaluation about the quality of the course, with respect to previous years.

- [CyberChallenge](#) (cryptography, cybersecurity), high school and college students, 20 hours, 3 years **Mar. 2019 – Current**
- Cybersecurity (crypto), master students, 40 hours, 5 years **Oct. 2014 – Current**
- Programming 2 (OOP, Java), bachelor students, 40 hours, 7 years **Mar. 2013 – Current**

**Organizer of courses** As organizer I plan course arguments, coordinate teachers, evaluate students, and interact with stakeholders.

- [CyberChallenge 2021](#) Member of the organizers team at University of Cagliari

**Scientific Talks and Short Lectures** As researcher I present the results of my research group in international conferences and conduct lectures in scientific schools.

- [An overview of blockchain-based systems for digital coupons](#) - 13 Jul. 2020 - online
- [2nd Scientific School on Blockchain and DLT](#) - 13 Jun. 2019 - Pula, Italy
- [Blockchain for engineering and architecture](#) - 29 Jan. 2019 - Roma, Italy
- [1st Scientific School on Blockchain and DLT](#) - 13 Jun. 2018 - Pula, Italy
- [A general framework for blockchain analytics](#) - 12 Dec. 2017 - Las Vegas, USA
- [An empirical analysis of smart contracts](#) - 7 Apr. 2017 - Sliema, Malta
- [An analysis of OP RETURN metadata](#) - 7 Apr. 2017 - Sliema, Malta
- [An analysis of OP RETURN metadata](#) - 17 Mar. 2017 - Stirling, Scotland
- [Innova.re](#) - 5,6 Nov. 2015 - Cagliari, Italy

## PUBLICATIONS

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- L. Marchesi, M. Marchesi, L. Pompianu, R. Tonelli. **Security checklists for Ethereum smart contract development: patterns and best practices.**
- A. S. Podda, L. Pompianu. **An overview of blockchain-based systems and smart contracts for digital coupons.** In Proc. ICSE 2020, WETSEB Workshop.
- M. Bartoletti, B. Bellomy, L. Pompianu **A journey into Bitcoin metadata.** In Journal of Grid Computing 17(1), 3-22, 2019.
- M. Bartoletti, T. Cimoli, L. Pompianu, S. Serusi. **Blockchain for social good: a quantitative analysis.** In Proc. GOODTECHS 2018.
- M. Bartoletti, A. Bracciali, S. Lande, L. Pompianu. **A general framework for blockchain Analytics.** In Proc. MIDDLEWARE 2017, Serial Workshop.
- M. Bartoletti, L. Pompianu. **An empirical analysis of smart contracts: platforms, applications, and design patterns.** In Proc. FC 2017, Workshop on Trusted Smart Contracts.
- M. Bartoletti, L. Pompianu. **An analysis of Bitcoin OP RETURN metadata.** In Proc. FC 2017, Bitcoin Workshop.
- N. Atzei, M. Bartoletti, T. Cimoli, S. Lande, M. Murgia, A. S. Podda, L. Pompianu. **Contract-oriented programming with timed session types.** In Behavioural Types: from Theory to Tools, 2017.
- M. Bartoletti, T. Cimoli, M. Murgia, A. S. Podda, L. Pompianu. **A contract-oriented middleware.** In Proc. 12th International Conference on Formal Aspects of Component Software (FACS 2015).
- M. Bartoletti, T. Cimoli, M. Murgia, A. S. Podda, L. Pompianu. **Compliance and sub-typing in timed session types.** In Proc. 35th IFIP International Conference on Formal Techniques for Distributed Objects, Components, and Systems. (FORTE 2015). Pages 161-177.

## MISCELLANEOUS

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### PhD courses and schools

- [2nd Scientific School on Blockchain and DLT](#) - 13 Jun. 2019 - Pula, Italy
- [1st Scientific School on Blockchain and DLT](#) - 13 Jun. 2018 - Pula, Italy
- [The Swiss Blockchain Summer School](#) - 21-24 Jun. 2017 - Lausanne, Switzerland
- [Summer School in Computer Security and Privacy](#) - 5-9 Sep. 2016 - Pula, Italy
- [Bertinoro International Spring School 2015](#) - 9-13 Mar. 2015 - Bertinoro, Italy

**Languages** Italian (mother tongue), English (B2 Written-Spoken)

**Research Interests** Bitcoin, Ethereum, Hyperledger Fabric, smart contracts, tools and techniques for blockchain analytics, languages and design patterns for smart contracts, computer security, programming languages, distributed systems.

I authorize the processing of my personal data in accordance with Legislative Decree 196 of 30 June 2003 and the GDPR (EU Regulation 2016/679).

06/03/2021