<table>
<thead>
<tr>
<th>Time</th>
<th>Wednesday, October 11</th>
<th>Thursday, October 12</th>
<th>Friday, October 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:30</td>
<td>Registration and Welcome Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
</tr>
<tr>
<td>9:30-10:00</td>
<td>Keynote #1: Sara Tucci-Piergiovanni</td>
<td>Keynote #2: Andreas Sommerwerk (Deutsche Telekom, Germany)</td>
<td>Keynote #3: Perrine de Costilogon (University of Lille, France)</td>
</tr>
<tr>
<td>10:00-10:15</td>
<td>Opening Ceremony</td>
<td>Coffee break</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:15-10:30</td>
<td>Technical Session #1: Fundamentals I</td>
<td>Technical Session #4: Smart Contracts I</td>
<td>Technical Session #7: Application Domains &amp; Use Cases</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>11:00-12:15</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:15-12:30</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30-14:00</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00-15:30</td>
<td>Technical Session #2: Fundamentals II</td>
<td>Technical Session #5: Smart Contracts II</td>
<td>Technical Session #6: DeFi &amp; Cryptocurrencies</td>
</tr>
<tr>
<td>15:30-16:00</td>
<td>Coffee break &amp; Demo/Poster</td>
<td>Coffee break &amp; Demo/Poster</td>
<td></td>
</tr>
<tr>
<td>16:00-17:20</td>
<td>Technical Session #3: Security, Privacy, Attacks</td>
<td>Technical Session #6: DeFi &amp; Cryptocurrencies</td>
<td></td>
</tr>
<tr>
<td>17:20-18:30</td>
<td>Panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30-20:00</td>
<td>Welcome reception</td>
<td>Conference Dinner</td>
<td></td>
</tr>
<tr>
<td>20:00-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Welcome Message from the Chairs

We warmly welcome you to the 5th edition of BRAINS, the reference conference on Blockchain Research & Applications for Innovative Networks and Services.

This year we will have the great pleasure to welcome three keynote speakers who will provide us with unique insights into the world of Blockchain and Web3, from various perspectives and for various applications: Sara Tucci-Piergiovanni (CEA List, Paris Saclay University, France), Andreas Sommerwerk (Deutsche Telekom, Germany), and Perrine de Coëtlogon (University of Lille, France).

Scientific contributions cover 5 main topics:
- Blockchain fundamentals (Session #1 and #2)
- Security, privacy and attacks (Session #3)
- Smart contracts (Sessions #4 and #5)
- DeFi & Cryptocurrencies (Session #6)
- Application domains & use cases (Session #7)

Moreover, you will have the opportunity to interact with academic and industry key players during the panel, dedicated to “Blockchain for Future Telecommunications - Just a Hype or a Real Opportunity?”

Thank you for joining us at BRAINS 2023. Enjoy!
**Blockchains Consensus Protocols, from Bitcoin to Ethereum 2.0**

Sara Tucci-Piergiovanni  
(CEA List, Paris-Saclay University, France)

*Sara Tucci-Piergiovanni* leads the Laboratory for trustworthy Distributed Systems at CEA List, Paris-Saclay University, France. Before joining CEA, she held a lecturer position at the University of Rome La Sapienza, where she obtained a Ph.D. in computer science. Sara’s main research focus is on distributed computing and systems, and she regularly publishes her research findings in renowned conferences and journals in the field. In recent years, Sara’s research has been primarily centered on the design and security of blockchain consensus protocols and incentives, covering both theoretical foundations and applications.

**Abstract:** Bitcoin introduced a fully decentralized, peer-to-peer consensus protocol that enables secure transaction validation in an open network, marking a departure from previous Byzantine Fault Tolerant (BFT) protocols primarily designed for closed networks. An innovative combination of cryptographic and incentive mechanisms ensures the protocol’s robustness over the years. However, it’s important to acknowledge the considerable energy consumption of Bitcoin’s Proof-of-Work mechanism, which remains a significant concern. To address these energy concerns, there have been efforts to transition to more environmentally friendly solutions, such as Proof-of-Stake BFT protocols, like Ethereum 2.0. While these newer proposals hold promise in terms of energy efficiency, they come with complexities and ongoing issues in incentive design. In this talk I will present the main features and differences of Proof-Stake-BFT proposals with respect to Bitcoin, to appreciate their maturity and outline open issues and ongoing research challenges.

---

**Creating Business Value with a Decentralized Approach**

Andreas Sommerwerk  
(Deutsche Telekom, Germany)

Having a product design background, Andreas is an experienced Service Design Lead with a focus in telecommunications industry. He worked in the areas of user research and experience design for various companies and is now focused on translating decentralized technology into real world applications at T-Labs, the research and development department of Deutsche Telekom.

**Abstract:** This keynote gives an insight into how technological concepts such as DLT are translated into business value at Deutsche Telekom. Today, also large corporations transact using intermediaries: banks, notaries, governments, stock exchanges, social networks, clearing houses, etc. These intermediaries provide the trust that is necessary when transacting with business partners. However, intermediaries create dependencies, cost, and slow down processes. T-Labs, the R&D unit of Deutsche Telekom, is researching the role of decentralized approaches such as blockchain and distributed ledger technology in the areas of telco with a focus in three key subtopics: communication networks, finance, and digital identity. The aim is to create solutions that overcome the drawbacks of centralized approaches and intermediaries. The keynote includes some concrete examples of past and ongoing projects.

---

**In education, from vision to pan European public and innovative transformation**

Perrine de Coëtlogon  
(University of Lille, France)

Perrine de Coëtlogon is in charge of Blockchain & Open Education within the Directorate for Pedagogical Innovation of the University of Lille. She represents French authorities in the European Blockchain Partnership and is the French national contact point of EBSI. With the team of University of Lille, already 50,000 blockchain diplomas have been sent to alumni students, verified in 146 countries more than 80,000 times. She is also in charge of developing open education activities and policy within the university. She has been elected as the President of the Board of Open Education Global in September 2023. [https://www.oeglobal.org/](https://www.oeglobal.org/)

**Abstract:** Last year, Vitalik Buterin said a "one sole token" would be convenient for non-transferable assets such as a diploma? You may wonder why more and more people in blockchain technologies speak about issuing and verifying diploma, skills and competences or even "micro-credits" in a wallet? the fact is that higher education eco-system has quickly understood how to take the best advantages of the new ideas and technologies, in particular in the open source family.
**Wednesday, October 11, 2023**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30 - 10:00</td>
<td>Registration</td>
</tr>
<tr>
<td>10:00 - 10:15</td>
<td>Opening ceremony</td>
</tr>
<tr>
<td>10:15 - 11:00</td>
<td>Keynote 1: Blockchain Consensus Protocols, from Bitcoin to Ethereum 2.0</td>
</tr>
<tr>
<td></td>
<td><strong>Speaker:</strong> Sara Tucci-Piergiovanni (CEA List, Paris-Saclay University, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Session Chair:</strong> Antonella Del Pozzo (CEA List, Paris-Saclay University, France)</td>
</tr>
<tr>
<td>11:00 - 12:30</td>
<td>TS #1: Fundamentals I</td>
</tr>
<tr>
<td></td>
<td><strong>Session Chair:</strong> Quentin Bramas (University of Strasbourg, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Fair Reward Distribution in Federated Byzantine Agreement Systems</strong></td>
</tr>
<tr>
<td></td>
<td>Charmaine Ndolo (Humboldt-Universität zu Berlin, Germany); Martin Florian (Humboldt-Universität zu Berlin &amp; Weizenbaum Institute for the Networked Society, Germany); Florian Tschorsch (Technische Universität Berlin, Germany)</td>
</tr>
<tr>
<td></td>
<td><strong>Exploring Locality in Ethereum Transactions</strong></td>
</tr>
<tr>
<td></td>
<td>Matthieu Pigaglio (UCLouvain, Belgium); Michal Krol (City, University of London, United Kingdom (Great Britain)); Etienne Riviere (UCLouvain, Belgium)</td>
</tr>
<tr>
<td></td>
<td><strong>Fairness Notions in DAG-based DLTs</strong></td>
</tr>
<tr>
<td></td>
<td>Mayank Raikwar (University of Oslo, Norway); Nikita Polyanskii (IOTA Foundation, Germany); Sebastian Müller (Aix Marseille University, France)</td>
</tr>
<tr>
<td>12:30 - 14:00</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>14:00 - 15:30</td>
<td>TS #2: Fundamentals II</td>
</tr>
<tr>
<td></td>
<td><strong>Session Chair:</strong> Romaric Ludinard (IMT Atlantique, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Computing the Heaviest Conflict-free SUB-DAG in DAG-based DLTs</strong></td>
</tr>
<tr>
<td></td>
<td>Quentin Bramas (University of Strasbourg, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Eiffel: Extending Formal Verification of Distributed Algorithms to Utility Analysis</strong></td>
</tr>
<tr>
<td></td>
<td>Arian Baloochestani Asl and Leander Jehl (University of Stavanger, Norway)</td>
</tr>
<tr>
<td></td>
<td><strong>Proven Transaction Flow Control for zk-Rollups</strong></td>
</tr>
<tr>
<td></td>
<td>Sergio Martinez (ISAE-SUPAERO, France); Thomas Lavau (ISAE-SUPAERO &amp; Université Toulouse III Paul Sabatier, France); Jerome Lacan (ISAE-Supaero and University of Toulouse, France); Caroline Ponzoni Carvalho Chanel (ISAE-SUPAERO, Université de Toulouse, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Mining in Logarithmic Space with Variable Difficulty</strong></td>
</tr>
<tr>
<td></td>
<td>Benjamin Loison (École Normale Supérieure Paris-Saclay, France)</td>
</tr>
<tr>
<td>15:30 - 16:00</td>
<td>Coffee Break &amp; Demo/Poster</td>
</tr>
<tr>
<td>16:00 - 17:20</td>
<td>TS #3: Security, Privacy, Attacks</td>
</tr>
<tr>
<td></td>
<td><strong>Session Chair:</strong> Emmanuelle Anceau (IRIS, France)</td>
</tr>
<tr>
<td></td>
<td><strong>Moving Towards Open Radio Access Networks with Blockchain Technologies</strong></td>
</tr>
<tr>
<td></td>
<td>Nischal Aryal (Orange Innovation, Institut Polytechnique de Paris, IMT, France)</td>
</tr>
<tr>
<td>17:20 - 18:30</td>
<td>Panel: Blockchain for Telecoms – Just a Hype or real Opportunity?</td>
</tr>
<tr>
<td></td>
<td><strong>Moderator:</strong> Axel Küpper (TU Berlin, Germany)</td>
</tr>
<tr>
<td></td>
<td><strong>Panelists:</strong></td>
</tr>
<tr>
<td></td>
<td>- Sami Souihi (UPEC, France)</td>
</tr>
<tr>
<td></td>
<td>- Sara Tucci-Piergiovanni (CEA List, Paris-Saclay University, France)</td>
</tr>
<tr>
<td></td>
<td>- Emmanuel Bertin (Orange Labs, France)</td>
</tr>
<tr>
<td></td>
<td>- Andreas Sommerwerk (Deutsche Telekom, Germany)</td>
</tr>
<tr>
<td>18:30</td>
<td>Welcome Reception</td>
</tr>
</tbody>
</table>
Thursday, October 12, 2023

09:30 - 10:30 Keynote 2: Creating Business Value with a Decentralized Approach
Speaker: Andreas Sommerwerk (Deutsche Telekom, Germany)
Session Chair: Axel Küpper (TU Berlin, Germany)

10:30 - 11:00 Coffee Break

11:00 - 12:30 TS #4: Smart Contracts I
Session Chair: Sami Souihi (University Paris Est UPEC, France)

A Transpilation-based Approach to Writing Secure Access Control Smart Contracts
Badr Bellaj (INPT- Rabat RAIISS Laboratory & Mchain, Morocco); Aafaf Ouaddah (INPT, Morocco); Noel Crespi (Institut Mines-Télécom, Télécom SudParis, France); Abdellatif Mezrioui (National Institute of Posts and Telecommunications, Morocco); Emmanuel Bertin (Orange Labs, France)

Gas Optimization Patterns in Move Smart Contracts on the Aptos Blockchain
Eric Keilty and Keerthi Nelaturu (University of Toronto, Canada); Anastasia Kastania (Athens University of Economics and Business, Greece); Andreas Veneris (University of Toronto, Canada)

Decentralized Ethereum-Based Solution for Mitigating Oracle Single Point of Failure
Julien Hatin and Valentin Andre (Orange Innovation, France)

Trusting a Smart Contract Means Trusting Its Owners: Understanding Centralization Risk
Metin Lamby, Valentin Ziegmeier and Christian Ziegler (Technical University of Munich, Germany)

12:30 - 14:00 Lunch Break

14:00 - 15:30 TS #5: Smart Contracts II

SmartExecutor: Coverage-Driven Symbolic Execution Guided by a Function Dependency Graph
Qiping Wei, Fadul Sikder, Huadong Feng and Yu Lei (University of Texas at Arlington, USA); Raghu Kacker (NIST, USA); Joran Honig (ConsenSys Diligence, Germany); Richard Kuhn (National Institute of Standards and Technology, USA)

CUSC: Composable User-Centric Smart Contracts
Markus Knecht (University of Zürich & University of Applied Sciences Northwestern Switzerland, Switzerland); Burkhard Stiller (University of Zürich, Switzerland)

Who is Smarter? An Empirical Study of AI-based Smart Contract Creation
Rabimba Karanjai (University of Houston, USA); Edward Li (USA); Lei Xu (Kent State University, USA); Weidong (Larry) Shi (University of Houston, USA)

Deferral: On the Feasability of High-volume Blockchain-based Referral Systems
Bruno Rodrigues, Tobias Boner and Thomas Bocek (University of Zurich, Switzerland); Burkhard Stiller (University of Zürich, Switzerland)

15:30 - 16:00 Coffee Break & Demo/Poster

16:00 - 18:00 TS #6: DeFi & Cryptocurrencies

Demystifying Just-in-Time (JIT) Liquidity Attacks on Uniswap V3
Xihan Xiong and Zhipeng Wang (Imperial College London, United Kingdom (Great Britain)); William Knottenbelt (Imperial College, United Kingdom (Great Britain)); Michael Huth (Imperial Colleague of London, United Kingdom (Great Britain))

Deep Learning-based Cryptocurrency Price Prediction: A Comparative Analysis
Armin Mazzinani, Luca Davoli and Gianluigi Ferrari (University of Parma, Italy)

Generic and Universal Local Cryptocurrency: LCoin
Frederic A Hayek (Université Clermont Auvergne & LiMOS, France); Pascal Lafourcade (LiMOS, Clermont University, France); Ariane Tichit (Université Clermont Auvergne, France)

We Are Launching our own NFT! Characterizing Fashion NFT Transactions - Preliminary Results
Sarah Bouraga (University of Namur, Belgium)

Blockchain-Enabled Car Sharing Platform: Enhancing Reliability and Vehicle History Management
Chen Ben Tolila, Yarden Hovav and Hadassa Daltrophe (Shamoon College of Engineering, Israel); Kiril Danilchenko (University of Waterloo, Israel)

19:30 Conference Dinner
Friday, October 13, 2023

09:30 - 10:30 Keynote 3: In education, from vision to pan European public and innovative transformation
Speaker: Perrine de Coëtlogon (University of Lille, France)
Session Chair: Yackolley Amoussou-Guenou (Ponthean-Assas University, France)

10:30 - 11:00 Coffee Break

11:00 - 12:15 TS #7: Application Domains & Use Cases
Session Chair: Julien Hatin (Orange Innovation, France)

Decentralized Wireless (DeWi): which perspectives for Blockchain-based mobile networks?
Meroua Moussaoui (Orange Labs, Institut Polytechnique de Paris, IMT, Telecom SudParis, France); Emmanuel Bertin (Orange Labs, France); Noel Crespi (Institut Mines-Télécom, Télécom SudParis, France)

Blockchain-based, Privacy-preserving, First Price Sealed Bid Auction (FPSBA) Verifiable by Participants
Ehsan Ghasaei and Amirali Baniasadi (University of Victoria, Canada)

On the Blockchain Selection in Agri-Food Tracking Systems
Fabio Scanu (Sapienza - University of Rome, Italy)

Moving to IPv6-Only and Sunsetting IPv4-NAT: Empowering end to end Network Apps such as Blockchain
Latif Ladid (University of Luxembourg / IPv6 Forum, Luxembourg)

Enhancing Multi-label Vulnerability Detection of Smart Contract using Language Model
Duong Vu, Tuan Van Nguyen and Van Tong (Hanoi University of Science and Technology, Vietnam); Sami Souihi (University Paris Est UPEC, France)

12:15 - 12:45 Closing Ceremony & Awards

12:45 - 14:00 Lunch
BRAINS 2023 Welcome Reception

The Welcome Reception will take place on Wednesday October 11 in

Salon d’Honneur of Cnam Paris,

which is next to the main one, at "2 rue conté, Paris": 1st floor, stair 37, at the end of a XIX century mosaic corridor.
(Refer to 37 and the red itinerary on the map)

BRAINS 2023 Dinner

Thursday October 12, 2023 at 8:00pm

at

LA PLAGE PARISIENNE

Port de Javel Haut

Statue de la Liberté

75015 Paris

Directions:

Take metro 4 direction "Bagneux - Lucie Aubrac" from "Réaumur - Sébastopol" station, change at "Odéon" to metro 10 direction "Boulogne Pont de Saint-Cloud", stop at station "Javel - André Citroën", then walk for 5 minutes.
General Co-Chairs

Conpassion Askoeame
(IRISA, France)

Ennemond Bertho
(Orange Innovation, France)

TPC Co-Chairs

Axel Klipper
(TU Berlin, Germany)

Antonella Del Pozzo
(CEA, France)

Local Chair

Pedro Biessy
(CNAM, France)

Posters Chair

Irene Gage
(Institute of Research and Technology I-rocom, France)

Publicity Co-Chairs

Nour El Madhoun
(ISEP School, France)

Shantanu Pal
(Desh University, Australia)

Publication Chair

Nath Salhab
(SNCF-Relais, France)

Overall arrangements Chair

Aliza Lewis
(DNAC, France)

Web/IT Chair

Elia Kellas
(DNAC, France)