CURRICULUM VITAE OF OVIA SESHADRI

Ph.D. Scholar, Department of Computer Science, IIT Delhi, Huaz Khas, Delhi, India-110016
(+91) 88262 88396 ⋄ oviaseshadri@gmail.com

EDUCATION

Doctorate of Philosophy (Ph.D.) in Computer Science *July 2015 - Present*[§]
Indian Institute of Technology(IIT), Delhi CGPA: 8.25/10
Advised by Dr Vinay Ribeiro (IITB) and Dr Subodh Sharma (IITD)
Department of Computer Science and Engineering
§ Synopsis completed and Thesis submitted

Thesis Summary - *Securely Improving Performance in PoW Blockchains using Links and Anchors:* We reduce the trade-off between security and performance in PoW blockchains through our novel concepts of *Links* and *Anchors*. They are small, fast and frequent structures that can be incorporated on any new or existing PoW blockchains. They help reduce the confirmation time of their underlying blockchain while preserving its consistency security guarantees.

M.S. Software Engineering (5 year B.Tech. + M.S. Integrated course) *July 2008 - May 2013*
VIT University, Vellore CGPA: 9.16/10[†]
† Graduated in top 5% in a batch of 300+

RESEARCH INTERESTS

Blockchain, Network Security, Distributed Systems, Databases

RESEARCH PUBLICATIONS

- "Securely Improving Stability and Performance of PoW Blockchains using Anchors", **Ovia Seshadri**, Vinay J, Ribeiro and Shadab Zafar, COMSNETS 2022.
- "Securely Boosting Chain Growth and Confirmation Speed in PoW Blockchains", **Ovia Seshadri**, Vinay J, Ribeiro and Aditya Kumar, IEEE Blockchain 2021.

PATENTS

- "Method in blockchain systems for fast stabilization and increased responsiveness using Anchors", Vinay J. Ribeiro and Ovia Seshadri,
  Patent submitted in India (2019) (Application Number - 201911004921)
  Patent submitted in USA (2021) (US20220108313A1; US17/428,304)
  International PCT (2019) - WO2020161530A1
  URL - https://patents.google.com/patent/US20220108313A1
- "Method in blockchain systems for fast stabilization and increased responsiveness using Links", Vinay J. Ribeiro and Ovia Seshadri,
  Patent submitted in India (2020) (Application Number - 201911023814)
  International PCT (2020) - WO2020254923A1
  URL - https://patents.google.com/patent/WO2020254923A1

SELECTED TALKS

- Invited to present a talk "Securely improving performance of PoW blockchains using anchors" at Workshop on Blockchains and Networking at ACM Sigmetrics 2022 in Mumbai in June 2022.

- Invited to present a talk "Mechanisms for improved security and performance of PoW Blockchains" at the National Research Evaluation Workshop of the Vishvesvaraya PhD scheme for electronics and IT by the Ministry of Electronics and Information Technology (MeitY), Government of India in Chandigarh in July 2019.
- Invited to present a talk on "Near real time consensus using Hashgraph in IoT systems" at the 5th International Workshop on Cyber security in Kyushu University, Fukuoka, Japan in July 2017.

WORK EXPERIENCE

Aris Global Software Pvt. Ltd. July 2013 - June 2015
Principal Software Engineer

· Promoted to Principal Software Engineer from Senior Software Engineer from Dec 2014 based on performance in the project.
· Worked on Project "agHub" which is a DWH solution for safety systems. It is a data mart which efficiently stores safety data for reporting purposes.
· Was designated the role of data modeler and developed a dimensional model of the DWH. Involved in the development of ETL jobs to trafer data from RDBMS to DWH. Involved in lending support to reporting teams working on BO and COGNOS.
· Involved with customers on discussions related to requirement analysis and issue resolution. Provided support to the testing and QC team in understanding the project setup and project overview.

INTERNSHIPS

- IBM IRL, Bangalore from July to October 2017, on project titled "Blockchain like Relational Database" under Dr Praveen Jayachandran. Details in Research project section.
- Aris global Pvt. Ltd., Bangalore from January to June 2013 on Project titled "AgCarbon - A platform of highly scalable and reusable components for Life Sciences Industry" under the guidance of Anish Anand.
- Monkey Creative Labs Pvt. Ltd., Chennai from May to December 2011, on Project titled "WEBEEPS-Revolutionizing the concept of collaboration through web based communication" under the guidance of Sharadha Ramakrishnan.

PEER REVIEWS

- Reviewer for Transactions on Management Information Systems(TMIS) and Conference on COMmunication Systems NETworkS (COMSNETS)

RESEARCH PROJECTS

- **Anchors for stability, Security and performance of PoW Blockchains**
  Proof-of-work (PoW) consensus generates blocks at random time instants, and consequently, adds weight to the blockchain at these same instants. This unsteady increase in chain weight over time is the root cause of many security and performance problems in the form of forks. This work tries to prevent forks and reduce chances of selfish mining and double spend attacks in existing blockchain systems. This work has Indian and USA patents and an International PCT filing. It is published in IEEE Blockchain 2021.
  URL - https://ieeexplore.ieee.org/abstract/document/9668572
  Advisor: Dr Vinay Ribeiro, IIT Bombay
- **Links: Making PoW Blockchains robust via steady chain growth**
  A major short coming of PoW blockchains is their inability to scale to low confirmation times required for typical micro payments. The main reason for this is the unsteady growth in chain

weight. This work proposes a simple solution where chain growth is maintained in a steady manner and linear structure of the blockchain is maintained. We also lower confirmation times while maintaining security guarantees. Links are a better alternative to solutions that try to improve confirmation times by reducing block size and interval. This work has an Indian patent and has an International PCT filing. It is published in COMSNETS 2022.
URL - https://ieeexplore.ieee.org/abstract/document/9680576
Advisor: Dr Vinay Ribeiro, IIT Bombay

- **Blockchain like Relational Database**
  This project was in collaboration with IBM IRL, Bangalore during July to October 2017. This project aimed to bring blockchain properties like immutability and decentralization into relational databases to make them more powerful for certain applications in supply chain management.
  Advisor: Dr Praveen Jayachandran, IBM IRL

- **Near real time consensus using Hashgraph in IoT systems**
  This project was a part of Indo-Japanese Research projects for communications in IoT Networks during January to July 2017. This project was part of "Work Package 3: Develop an application layer trusted framework" in a series of Indo-japanese collaborations. Here we built a prototype for a lightweight consensus protocol in IoT networks using Hashgarph with BFT consensus as opposed to the heavy PoW consensus.
  Advisors: Dr Subodh Sharma, IIT Delhi and Dr Kosuke Kaniko, Kyushu University, Japan

CONFERENCES AND WORKSHOPS

- Conducted the blockchain workshop as part of training for The Central Reserve Police Force (CRPF) on "Network Security and Cryptography" at IIT Delhi in April 2021.
- Selected to volunteer and organize Comsnets 2019 held in IISc, Bangalore in January 2019. Chaired the workshop on Blockchains as part of the Conference.
- Invited to the Pepsico Million Women Mentorship Programe in Gurgaon in October 2018.
- Selected to volunteer at the prestigious ACM Mobicom 2018 held in Delhi in October 2018.
- Sponsored Participant Grace Hopper Celebration of Women in Computing India (GHCI) 2016 conference held at Bangalore in December 2016.
- Invited to IBM women in research program called Maitreyee at IBM IRL, Delhi in November 2016.
- Selected to volunteer at the prestigious VLDB 2016 conference held in Delhi in September 2016.
- Sponsored to attend the Microsoft Summer school on the Internet of Things in June 2016 held at the Indian Institute of Science, Bangalore.
- Volunteered in the 4th International conference on Big Data Analytics in NIT Warangal in December 2015.

HONORS AND AWARDS

- A Visvesvaraya PhD fellow availing Government scholarship from July 2015.
- Sponsored Student of the Indo-Japanese research collaboration by the Indian and Japanese governments.
- Qualified UGC-NET National level Exam for Computer Science and Applications in June 2015.
- Qualified All India Graduate Aptitude Test Engineering(GATE) for Computer Science and Information Technology conducted by MHRD in March 2013 and in March 2015.

GRADUATE TEACHING ASSISTANT

Networks and System Security [SIL765][Spring 2017, Spring 2018, Spring 2019]

Special Topics in High Speed Networks: Blockchain [COL867][Fall 2017]

Computer Networks [COL672][Fall 2016, Fall 2018]

Introduction to Database Systems [COL632][Spring 2016]

Special topics in DB systems: Data Mining [CSL868][Fall 2015]

TECHNICAL SKILLS

Computer Languages	Python, C/C++, Java, php, SQL
Software & Tools	LaTeX, MS office, ERWIN, Talend
Technologies	Bitcoin, Ethereum

PERSONAL DETAILS

E-mail	oviaseshadri@gmail.com
Phone	+91 88262 88396
D.O.B.	2nd July 1991
LinkdIn	linkedin.com/ovia-seshadri-14b75124/
GitHub	github.com/oviaseshadri

REFERENCES

Dr Vinay J. Ribeiro
Associate Professor
vinayr@iitb.ac.in
Department of Computer Science
Indian Institute of Technology Bombay (IITB)

Dr Subodh V. Sharma
Associate Professor
svs@cse.iitd.ac.in
Department of Computer Science
Indian Institute of Technology Delhi (IITD)

Dr Bijendra N. Jain
Distinguished Professor
Bnjain.bits@gmail.com
Department of Computer Science
Indraprastha Institute of Information Technology(IIIT), Delhi