Nima Afraz

School of Computer Science
University College Dublin
2.07, Computer Science Building,
UCD Belfield, Dublin, Ireland

Last updated: April, 2023
ORCID: 0000-0002-8422-9878
email: nima.afraz@ucd.ie
GitHub: @nimaafraz
Website: nima.ie

ACADEMIC APPOINTMENTS

2021–Present **Lecturer/Assistant Professor in Computer Science**
UCD School of Computer Science
Beijing-Dublin International College (BDIC)
University College Dublin, Ireland

2020–2021 **Government of Ireland Postdoctoral Fellow**
Irish Research Consul, CONNECT Centre
Blockchain for Telecommunications
Trinity College Dublin, Ireland

EDUCATION

2016–2020 **PhD in Computer Science**, Trinity College Dublin, Ireland
Awarded with no corrections
Areas of Focus: Blockchain for Telecom, Network Economics,
Optical Networks, Software Defined Networks
Dissertation: Techno-economics of Optical Access Network Sharing
Advisor: Prof. Marco Ruffini

2011–2014 **MSc in Computer Systems Architecture**, Qazvin Azad University, Iran
Areas of Focus: Fault-tolerant Systems, Computer Networks,
Low Power Design
Thesis: Exploring Delay-Based Congestion Control Algorithms
Advisor: Prof. Morteza Analoui

2007–2011 **BSc in Computer Hardware Engineering**, Ardabil Azad University, Iran
Areas of Focus: VLSI, Computer Networks, Computer Architecture
Thesis: Improving TCP Vegas Fairness and Performance
Advisor: Prof. Shahram Jamali

AWARDS & HONORS

2019 Google Inc. Cloud Platform Research Credits Award, $5000 cloud IaaS grant.

2018 Best Student Paper Award, Asia Communications and Photonics Conference, Hangzhou, China

GRANT PROPOSALS & FELLOWSHIPS

2022   Co-ordinated the integRated intElligent multi-modal tRanspOrt infrastrUcTurE: distributed localised decision-making at the network edge, "RE-ROUTE", under MARIE SKŁODOWSKA-CURIE ACTIONS, Staff Exchanges (SE), HORIZON-MSCA-SE-2021, (€708,400) [**Successful**];

2022   National Space Subsystems and Payloads Initiative (NSSPI) under the Disruptive Technologies Innovation Fund Call 4 (€187,778) [Invited for Interview];

2021   Contributor and **Work Package leader** for the Marie Skłodowska-Curie Actions Doctoral Networks (**HORIZON-MSCA-DN-2021**) proposal SEROTONIN: *Secure, trustworthy, and certifiable automation of open and disaggregated optical Networks.* [Unsuccessful]

2021   Co-Applicant for the SFI CONNECT Centre platform funding *Trusted Collaboration in Open-RAN (T-COR)* to hire a student for a joint PhD degree between MTU and UCD. Funding Allocated: **€115,500**

2021   Internal Industry funding proposal in CONNECT Centre with **Analog Devices** and **VMware**: *Autonomising Coordinated Time-Sensitive Decision Making at the Network Edge.* [Ongoing]

2020   I have been awarded the Government of Ireland Postdoctoral Fellowship (1-Year) by the **Irish Research Consul**: The project aimed to provide a robust evaluation methodology for blockchain use cases in the communications industry. Furthermore, it extended the work on distributed markets framework for network infrastructure sharing. Amount: **€45,955**.

TEACHING (UNDERGRADUATE)

2021–Present
5 ECTS,
≈ 100
Students

Module Coordinator

2_{nd} **Year: Data Structures and Algorithms I** *(Student Feedback 4.38/5)*
- Recorded 20+ hours of video lectures.
- Delivered 15 Live sessions.
- Minor updates to the course material including a new session on IDE-Based Debugging and unit Testing for Java.
- Graded continuous assessment.

School of Computer Science, Beijing-Dublin International College, UCD

2021–Present
5 ECTS,
≈ 120
Students

Module Coordinator

2_{nd} **Year: Object-Oriented Programming** *(Student Feedback 4.23/5)*
- Recorded 20+ hours of video lectures.
- Delivered 15 Live sessions.
- Minor updates to the course material including adopting a new IDE IntelliJ with enhanced tools for OOP.
- Graded continuous assessment.

School of Computer Science, Beijing-Dublin International College, UCD

2021–Present 5 ECTS, ≈ 100 Students	**Module Coordinator**

4_{th} **Year: Performance of Computer Systems** *(Student Feedback 4.4/5)*
- Enhanced the practical aspect of the module by introducing 5 new lab experiments.
- Prepared final exam questions.
- Recorded 20+ hours of video lectures.
- Delivered 12 Live sessions.
- Introduced a **guest lecture** from TCD researcher Sandip Das on the application of performance evaluation methods in Optical/Wireless networks.
- Graded continuous assessments and final exam papers.

School of Computer Science, Beijing-Dublin International College, UCD

2016–2020 5 ECTS, 130+ Students	1_{st} **year: Telecommunications I**

2_{nd} **year: Algorithms Java Programming**
- Laboratory demonstrations.
- Delivering weekly tutorials.
- Grading continuous assessments.

School of Computer Science and Statistics, Trinity College Dublin

STUDENT SUPERVISION

POSTGRADUATE PHD

2022–Present Seyed Bagher Hashemi Natanzi (Main Supervisor) University College Dublin
Open Radio Access Networks, Blockchain for Post-5G Communication Networks.

2021–Present Supporting the application of a number of potential candidates for IRC Government of Ireland Postgraduate Scholarship Programme and CSC China Scholarship.

UNDERGRADUATE

2019–2020 Stephen Moran (co-advising) Trinity College Dublin
On the use of blockchain for Forest Certification (Currently under consideration for commercialisation), Available on GitHub Repository

2019–2021 Six more undergraduate final year projects in the area of blockchain technology and its application in various industries including insurance, charity, mortgage, and cloud computing currently ongoing with Diarmuid Tully, Vishal Uchil, Aparna Ghosh, Christine Day, Brian Lynch, and Lakshita Sharma.

OUTREACH

- **Silicon Republic Article:** Is blockchain a friend or foe in ransomware attacks?
In light of the ransomware attacks on Ireland's Health Service Executive (HSE) in 2021, I have examined the possible role blockchain technology can play in exacerbating but also preventing such attacks.
- Maintaining a blog about my research, Blockchain, and Cloud Infrastructure that attracts more than 500 readers per month among which I have collaborated with some on research projects, medium.com/@nima.afraz post samples:

2020	Who Reviews for the Top IEEE Network Conferences?
2020	Monitoring Hyperledger Fabric Docker Containers with Prometheus & Grafana.
2019	Multi-Host Hyperledger Caliper Benchmarks Using Docker Swarm.

-Hosting and supervising transition year students from Larkin Community College in Dublin to work on a project entitled "Own your own Skype – WebRTC setup and test". The students became familiar with the environment of an academic research centre and had hands-on experience with building a communication network, TY Immersion Week.

TALKS

2022	Invited Guest lecture at Chalmers University, Sweden: Title: "In Networks we don't trust: Can Blockchain Solve that?"
2021	**N. Afraz**. Scaling Blockchain for Telecom Networks:An Impossible Trinity [Invited Webinar], IEEE UK and Ireland Section.
2020	H. Ahmadi, I. Macaluso, M. Ruffini, **N. Afraz**. Blockchain Technology and Smart Contracts in 5G and Beyond Networks [Tutorial Talk], ICC Conference Dublin 2020.
2020	H. Ahmadi, I. Macaluso, M. Ruffini, **N. Afraz**. Blockchain Technology and Smart Contracts in 5G and Beyond Networks [Tutorial Talk], EUCNC Conference Valencia, Spain 2019.

ACADEMIC SERVICE & AFFILIATIONS

PEER REVIEW

Journal, *IEEE Communications Surveys & Tutorials*
Journal, *IEEE Journal on Selected Areas in Communications*
Journal, *IEEE/OSA Journal of Lightwave Technology*
Journal, *IEEE Systems*
Journal, *IEEE Communication Magazine*
Journal, *Photonic Network Communications*

CONFERENCE ORGANIZAION
2022	Program Committee Member at Hyperledger Global Forum, Dublin

2022   Technical Program Committee (TPC) for IEEE International Conference on Advanced Networks and Telecommunications Systems, 18-21 December 2022, Gandhinagar, Gujarat, India

2018   Co-organizer and the Web-Chair (In charge of designing the website) of the ONDM (22th International Conference on Optical Network Design and Modeling, Dublin May 14-17, 2018)

MEMBERSHIP

IEEE
Irish Computer Society
Linux Foundation's Hyperledger Telecom SIG

OPEN-SOURCE COMMUNITY ENGAGEMENT

2019–Present   I am currently the vice chair in the Hyperledger Telecom Special Interest Group (hosted by the Linux Foundation) that is focused on technical and business-level conversations about appropriate use cases for blockchain technology in the Telecom industry. The following solution briefs were resulted from this collaboration:

N. Afraz, D. Boswell *et al.*, Decentralized ID and Access Management (DIAM) for IoT Networks, *Solution Brief.* Telecom Special Interest Group, 2021.

N. Afraz, V. Chaudhary *et al.*, Optimizing Wholesale Intercarrier Settlement with Hyperledger Blockchain, *Solution Brief.* Telecom Special Interest Group, 2019.

Blockchain-based SLA (Service Level Agreement) Management/Monitoring Network Proof of Concept, Available on GitHub Repository

RELATED EXPERIENCE

2011–2016   **Founder and Network Engineer**
Gazelle Network Consulting Group, Tehran, Iran
Designing and implementing computer networks for small business and medium-size companies (SOHO) and consulting services for hardware and software development.

2014–2015   **Technical Writer**
TechNevis (Digital Security and Online Freedom Information Network)
Writing on Internet security and user privacy from a critical perspective of new technologies and concepts such as the Internet of Thing, virtual reality, wearable gadgets and Social Networks.

LANGUAGES

Persian   First Language

Azerbaijani   Mother Tongue

English   Proficient (TOEFL IBT 103, Reading 28, Listening 30, Speaking 23, Writing 22)

PUBLICATIONS

PATENT

2018   M. Ruffini, A. Elrasad, **N. Afraz**, System and Method for Dynamic Bandwidth Assignment (DBA) Virtualization in a Multi-Tenant Passive Optical Network, Patent WO/2018/167 318, Sep., 2018.

BOOK CHAPTER

2021   **N. Afraz**, H. Ahmadi, M. Ruffini, Hyperledger Blockchain-Based Distributed Marketplaces for 5G networks, Wiley-IEEE, 2021.

PEER-REVIEWED JOURNAL PUBLICATIONS

2022   **N. Afraz** and M. Ruffini. Trusted Distributed Marketplace for Virtual Passive Optical Network Sharing [Invited] . *IEEE/OSA Journal of Optical Communications and Networking*, 2022

2021   **N. Afraz**, H. Ahmadi, and M. Ruffini. Blockchain and Smart Contracts for Telecommunications: Requirement vs. Cost Analysis. *IEEE Communications Magazine*, 2021, [Re-submission]

2020   M. Ruffini, A. Ahmad, S. Zeb, **N. Afraz**, and F. Slyne. Virtual DBA: Virtualizing Passive Optical Networks to Enable Multi-service Operation in True Multi-tenant Environments. *IEEE/OSA Journal of Optical Communications and Networking*, 12(4):B63–B73, 2020

2019   **N. Afraz** and M. Ruffini. A Sharing Platform for Multi-Tenant PONs. *Journal of Lightwave Technology*, 36(23):5413–5423, Dec 2018

2018   **N. Afraz**, F. Slyne, H. Gill, and M. Ruffini. Evolution of Access Network Sharing and Its Role in 5G Networks. *Applied Sciences*, 9(21):4566, oct 2019

PEER-REVIEWED CONFERENCE PROCEEDINGS

2020   **N. Afraz** and M. Ruffini. 5G Network Slice Brokering: A Distributed Blockchain-based Market. In *2020 European Conference on Networks and Communications (EuCNC): Network Softwarisation (NET) (EuCNC2020 - NET)*, Dubrovnik, Croatia, June 2020

2020   M. Hajizadeh, **N. Afraz**, M. Ruffini, and T. Bauschert. Collaborative Cyber Attack Defense in SDN Networks using Blockchain Technology. In *(SecSoft 2020)*, Ghent, Belgium, July 2020

2019   **N. Afraz** and M. Ruffini. A Distributed Bilateral Resource Market Mechanism for Future Telecommunications Networks. In *2019 IEEE Global Communications Conference (GLOBECOM)*, December 2019

2019   **N. Afraz**, Frank Slyne, and Marco Ruffini. Full PON Virtulisation Supporting Multi-Tenancy Beyond 5G. In *OSA Advanced Photonics Congress (AP) 2019*, page NeT2D.2. Optical Society of America, 2019[**Invited**]

2018   **N. Afraz** and M. Ruffini. A Marketplace for Real-time Virtual PON Sharing. In *2018 Asia Communications and Photonics Conference (ACP)*, pages 1–3, Oct 2018 [**Best Student Paper Award**]

2018   **N. Afraz**, A. Elrasad, and M. Ruffini. DBA Capacity Auctions to Enhance Resource Sharing Across Virtual Network Operators in Multi-Tenant PONs. In *2018 Optical Fiber Communications Conference and Exposition (OFC)*, 2018

2017   **N. Afraz**, A. Elrasad, H. Ahmadi, and M. Ruffini. Inter-operator Dynamic Capacity Sharing for Multi-tenant Virtualized PON. In *2017 IEEE 28th Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC)*, pages 1–6, Oct 2017

2017   A. Elrasad, **N. Afraz**, and M. Ruffini. Virtual Dynamic Bandwidth Allocation Enabling True PON Multi-tenancy. In *2017 Optical Fiber Communications Conference and Exhibition (OFC)*, pages 1–3, March 2017

2015   **N. Afraz** and M. Analoui. TCP-ArtaVegas: Improving the Fairness of TCP-Vegas. In *2015 23rd Iranian Conference on Electrical Engineering*, pages 761–764, 2015

Referees

Prof. Marco Ruffini	Prof. Henry B. McLoughlin
School of Computer Science and Statistics	School of Computer Science
Trinity College Dublin	University College Dublin
marco.ruffini@tcd.ie,+353 (1) 896-4336	henry.mcloughlin@ucd.ie,+353 (1) 716-2480
Prof. Hamed Ahmadi	David Boswell
Electronic Engineering	Director of Ecosystem
University of York	Linux Foundation
hamed.ahmadi@york.ac.uk	dboswell@linuxfoundation.org