

Joseph Finnegan

3 Briar Park, Hill Road, Bunratty, Co. Clare, Ireland

☎ Contact: (+353) 0857868114

✉ joseph.finnegan@protonmail.com

Experience

2016 – Now **Graduate Researcher (PhD)**, Advisors: *Dr. Stephen Brown & Dr. Ronan Farrell*,
Maynooth University, Ireland

Funded by CONNECT, Ireland's Research Centre for Future Networks and Communications

- Performed extensive simulation of LoRaWAN in ns-3, a robust network simulator, and undertook the first published analysis of specific LoRaWAN features in this simulator.
- Integrated an implementation of the LoRaWAN protocol into an embedded operating system, enabling use of dual stack applications on low power microcontrollers.
- Managed efficient use of resources for large scale simulations on Linux systems, including supercomputing infrastructure through the Irish Centre for High-End Computing (ICHEC).
- Published original work in recognised journals, and regularly conduct peer review for high quality journals.
- Presented research results at international conferences.

Jan. 2020 – **Invited Researcher**, Advisors: *Dr. M Shahwaiz Afaqui & Dr. Xavier Vilajosana*,
May. 2020 Universitat Oberta de Catalunya, Barcelona, Spain

- Analysed the potential effect of proposed error mitigation techniques in next-generation Wi-Fi.
- Explored the applicability of diversity combining techniques in increasing the scalability of LoRaWAN in urban multi-gateway environments.

2016 – now **Research and Teaching Assistant**, Maynooth University

- Presented tutorials for a computer networks undergraduate module, covering the full OSI model.
- Ran practicals for classes of 100+ undergraduate students in courses on the above (primarily through packet analysis), and for multimedia communications and operating systems.
- Supervised research projects on monitoring remote wireless experiments and LoRa-based IoT device software update via external Wi-Fi modules.

2015 – 2016 **Masters Researcher**, Advisor: *Dr. Majid Mirmehdi*, University of Bristol, UK

- Undertook courses on machine learning, genetic algorithms, high performance computing, and cloud computing.
- Developed a smart watch prototype for control of home devices via Bluetooth (team project).
- (Thesis) Extended a colour-and-depth detector to enable the tracking of multiple objects, for use in smart health applications.

Jan. 2014 – **Software Engineer Intern**, SAP, Ireland
Sep. 2014

- Developed modern web-based enterprise applications as a Scrum team member in an Agile environment.

2011 – 2015 **Undergraduate Researcher**, Maynooth University

- Contributed to the development and maintenance of a beginner-friendly Operating System for low power microcontrollers, and the construction of a 200 device testbed for low-rate wireless experiments.
- Analysed the performance of low-rate devices under a set of cybersecurity attacks.
- (Thesis) Performed a study of the relationship between data aggregation and reliability in wireless sensor networks using the testbed.

Education

2016 - Now **PhD.** in Computer Science, Maynooth University, Ireland

2015 - 2016 **MSc.** with Merit in Advanced Computing, University of Bristol, UK

2011 - 2015 **BSc.** with 1st Class Honours in Computer Science & Software Engineering, Maynooth University, Ireland

2014 Erasmus International Exchange, Izmir University of Economics, Turkey

Skills

Programming C, C++, Python, Matlab, Java, JavaScript, HTML & CSS.

Protocols Wireless: LPWAN (LoRaWAN in particular, but also knowledge of Sigfox and NB-IoT), Wi-Fi, IEEE 802.15.4. Internet: IPv4, IPv6, TCP, UDP, HTTP.

Platforms Linux (console, bash, monitoring and debugging), Contiki OS, ARM microcontrollers.

Tools / Libraries ns-3, Cooja, Wireshark, tcpdump, git, Gerrit, Slurm, OpenCV, Boost.

Languages English (fluent), Irish (intermediate), French (basic).

Publications

2020 **Joseph Finnegan**, M. Shahwaiz Afaqui, Ronan Farrell, Stephen Brown, Xavier Vilajosana. 2020. Analysis the Effect of Diversity Combining in dense LoRaWAN Networks. (in preparation)

2020 M. Shahwaiz Afaqui, **Joseph Finnegan**, Ronan Farrell, Stephen Brown, Xavier Vilajosana. 2020. Evaluation of the Potential of HARQ Schemes to Contribute to Reliability and Scalability of WiFi. (in preparation)

IEEE IoTJ **Joseph Finnegan**, Kyriaki Niotaki, Stephen Brown. 2020. Analysing the Feasibility of RF Energy Harvesting with LoRaWAN. (under review)

WoWMoM 2020 **Joseph Finnegan**, Ronan Farrell, Stephen Brown. 2020. Lightweight Timeslotting Through Periodicity Detection for Increased Scalability of LoRaWAN. In Proceedings of the 2020 IEEE International Symposium on a World of Wireless, Mobile, and Multimedia Networks (WoWMoM), Cork, Ireland.

- IEEE IoTJ **Joseph Finnegan**, Ronan Farrell, Stephen Brown. 2020. Analysis and Enhancement of the Adaptive Data Rate Scheme of LoRaWAN. IEEE Internet of Things Journal.
- CSCN 2018 **Joseph Finnegan**, Stephen Brown, Ronan Farrell. 2018. Evaluating the Scalability of LoRaWAN Gateways for Class B Communication in ns-3. In Proceedings of the 2018 IEEE Conference on Standards for Communications and Networking (CSCN), Paris, France.
- GIIS 2018 **Joseph Finnegan**, Stephen Brown, Ronan Farrell. 2018. Modeling the Energy Consumption of LoRaWAN in ns-3 Based on Real World Measurements. In Proceedings of the 2018 Global Information Infrastructure and Networking Symposium (GIIS), Thessaloniki, Greece.
- ISNCC 2018 **Joseph Finnegan**, Stephen Brown. 2018. An Analysis of the Energy Consumption of LPWA-based IoT Devices. In Proceedings of the 2018 International Symposium on Networks, Computers and Communications (ISNCC), Rome, Italy
- ZHE 2017 **Joseph Finnegan**, Stephen Brown. 2017. A Comparative Survey of LPWA Networking. Zhejiang University International Doctoral Students Conference, Hangzhou, China

Professional Contributions and Affiliations

- Reviewer for IEEE Sensors, IEEE Internet of Things, Network Traffic and Measurement (TMA), EURASIP Journal on Wireless Communications and Networking
- Memberships IEEE (Member, 2017 – Present), Irish Computer Society (Member, 2017 – Present)
- Certificates Accredited Professional Certificate in Teaching and Learning for Tutors and Demonstrators
- Summer Attendee of CONNECT Summer School Machine Learning for Communication Schools Systems and Networks, Trinity College, Dublin. Sep. 2019.

Researcher and Developer Profiles

- GitHub <https://github.com/ConstantJoe>
- LinkedIn <https://www.linkedin.com/in/joseph-finnegan-51b5b469/>
- ResearchGate https://www.researchgate.net/profile/Joseph_Finnegan