

## Paul H. Patras

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Year of birth: 1982. Place of birth: Bistrita, Romania.

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### Research Interests

wireless networks; network protocols and architectures; performance analysis and optimisation; mobile traffic analysis; security and privacy; test beds and prototyping.

### Employment

2013–present, Lecturer (Assistant Professor) and Chancellor’s Fellow, School of Informatics, The University of Edinburgh, UK; Member of the Institute for Computing Systems Architecture (ICSA).  
2011–2013, Research Fellow, Hamilton Institute, National University of Ireland Maynooth.  
2007–2011, Research Assistant, IMDEA Networks Institute, Madrid, Spain.  
2006–2007, Deployment Engineer, Alcatel-Lucent, Romania / France.

### Honorary Positions

2017, Mar.–May, Visiting Professor, Dept of Information Engineering, University of Brescia, Italy.  
2016, July–Aug., Visiting Researcher, CCIS, Northeastern University, USA.  
2016, May–June, Visiting Researcher, Secure Mobile Networking Lab, TU Darmstadt, Germany.  
2015, Apr.–June, Visiting Professor, Dept of Information Engineering, University of Brescia, Italy.  
2010, Jan.–July, Visiting Researcher, Networks Group, Rice University, USA.

### Other Affiliations

2017–present, Co-leader, Informatics Internet of Things Research Group, Edinburgh, UK.  
2013–present, Academic Member, EPSRC Centre for Doctoral Training in Pervasive Parallelism, UK.  
2014–present, Academic Member, Security & Privacy Group, Edinburgh, UK.  
2014–2015, Research Collaborator, Li-Fi R&D Centre, Edinburgh, UK.

### Education

2011, Ph.D., Telematics Engineering (cum laude), University Carlos III of Madrid, Spain.  
Advisor: Prof. Albert Banchs; Dissertation: “Control-Theoretic Adaptive Mechanisms for Performance Optimization of IEEE 802.11 WLANs: Design, Implementation and Experimental Evaluation”.  
2008, M.Sc., Telematics Engineering (cum laude), University Carlos III of Madrid, Spain.  
2006, Dipl.Eng., Telecommunications (cum laude), Technical University of Cluj-Napoca, Romania;  
Dissertation project at the Polytechnic University of Catalonia (UPC), Barcelona, Spain.

### Distinctions

2016, Supervisor of Ronan Turner, ‘Highly Commended’ in the Undergraduate Awards for “AlphaAP: Achieving Weighted Throughput in Virtualised WLANs.”.  
2015, Elsevier Computer Communications Outstanding Reviewer.  
2014, Selected to participate in the “Heriot-Watt Crucible VI” leadership and development programme for early career academics.  
2012, Outstanding Ph.D. Award, University Carlos III of Madrid.  
2012, Best-paper award nomination, “Exploiting the Capture Effect to Improve WLAN Throughput”, IEEE WoWMoM.  
2011, IEEE Communications Letters Exemplary Reviewer.  
2008, Author of the only M.Sc. dissertation receiving honours in the Telematics Engineering department of University Carlos III of Madrid.

## Publications

### Journal Papers

1. N. Facchi, F. Gringoli, D. Malone, **P. Patras**, “Imola: A Decentralised Learning-driven Protocol for Multi-hop White-Fi”, *Elsevier Computer Communications*, vol. 105, pp. 157–168, June 2016.
2. **P. Patras**, H. Feghhi, D. Malone, D. Leith, “Policing 802.11 MAC Misbehaviours”, *IEEE Transactions on Mobile Computing*, vol. 15, no. 7, pp. 1728–1742, July 2016.
3. **P. Patras**, A. Garcia-Saavedra, D. Malone, D. Leith, “Rigorous and Practical Proportional-fair Allocation for Multi-rate Wi-Fi”, *Elsevier Ad Hoc Networks*, vol. 36, Part 1, pp. 21–34, Jan. 2016.
4. **P. Patras**, H. Qi, D. Malone, “Mitigating Collisions through Power-Hopping to Improve 802.11 Performance”, *Elsevier Pervasive and Mobile Computing*, vol. 11, pp.41–55, Apr. 2014.
5. P. Serrano, **P. Patras**, A. Mannocci, V. Mancuso, A. Banchs, “Control Theoretic Optimization of 802.11 WLANs: Implementation and Experimental Evaluation”, *Elsevier Computer Networks*, vol. 57, no. 1, pp. 258–272, Jan. 2013.
6. P. Serrano, A. de la Oliva, **P. Patras**, V. Mancuso, A. Banchs, “Greening Wireless Communications: Status and Future Directions”, *Elsevier Computer Communications*, vol. 35, no. 14, pp. 1651–1661, Aug. 2012.
7. A. Banchs, P. Serrano, **P. Patras**, M. Natkaniec, “Providing Throughput and Fairness Guarantees in Virtualized WLANs through Control Theory”, *ACM/Springer Mobile Networks and Applications (MONET)*, vol. 17, no. 4, pp. 435–446, Aug. 2012.
8. **P. Patras**, A. Banchs, P. Serrano, “A Control Theoretic Scheme for Efficient Video Transmission over IEEE 802.11e EDCA WLANs”, *ACM Transactions on Multimedia Computing, Communications and Applications (TOMM)*, vol. 8, no. 3, pp. 29:1–29:23, July 2012.
9. **P. Patras**, A. Banchs, P. Serrano, A. Azcorra “A Control Theoretic Approach to Distributed Optimal Configuration of 802.11 WLANs”, *IEEE Transactions on Mobile Computing*, vol. 10, no. 6, pp. 897–910, June 2011.
10. P. Serrano, A. Banchs, **P. Patras**, A. Azcorra, “Optimal Configuration of 802.11e EDCA for Real-Time and Data Traffic”, *IEEE Transaction on Vehicular Technology*, vol. 59, no. 5, pp. 2511–2528, June 2010.
11. **P. Patras**, A. Banchs, P. Serrano, “A Control Theoretic Approach for Throughput Optimization in IEEE 802.11e EDCA WLANs”, *ACM/Springer Mobile Networks and Applications (MONET)*, vol. 14, no. 6, pp. 697–708, Dec. 2009.

### Refereed Conference Papers

12. C. Zhang, X. Ouyang, **P. Patras**, “ZipNet-GAN: Inferring Fine-grained Mobile Traffic Patterns via a Generative Adversarial Neural Network”, to appear in *Proceeding of the 13th International Conference on Emerging Networking Experiments and Technologies (ACM CoNEXT)*, Seoul/Incheon, South Korea, Dec. 2017.
13. H. Fereidooni, J. Classen, T. Spink, **P. Patras**, M. Miettinen, A.-R. Sadeghi, M. Hollick, M. Conti, “Breaking Fitness Records without Moving: Reverse Engineering and Spoofing Fitbit”, in *Proceedings of the 20<sup>th</sup> International Symposium on Research in Attacks, Intrusions and Defenses (RAID)*, Atlanta, GA, USA, Sept. 2017.
14. R. Li, **P. Patras**, “WiHaul: Max-Min Fair Wireless Backhauling over Multi-Hop Millimetre-Wave Links”, in *Proceedings of the 3<sup>rd</sup> ACM Workshop on Hot Topics in Wireless (HotWireless)*, New York City, NY, USA, Oct. 2016
15. C. Capretti, F. Gringoli, N. Facchi, **P. Patras**, “LTE/Wi-Fi Co-existence under Scrutiny: An Empirical Study”, in *Proceedings of the ACM 10<sup>th</sup> International Workshop on Wireless Network Testbeds, Experimental evaluation & CHaracterization (WiNTECH)*, New York City, NY, USA, Oct. 2016.
16. G. H. Sim, R. Li, C. Cano, D. Malone, **P. Patras**, J. Widmer, “Learning from Experience: Efficient Decentralized Scheduling for 60GHz Mesh Networks”, in *Proceedings of IEEE 17<sup>th</sup> International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Coimbra, Portugal, June 2016.

17. N. Facchi, F. Gringoli, D. Malone, **P. Patras**, “When Is the Right Time to Transmit in Multi-hop White-Fi?” (demo), in *Proceedings of IEEE 17<sup>th</sup> International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Coimbra, Portugal, June 2016.
18. D. Malone, H. Qi, D. Botvich, **P. Patras**, “802.11 Buffers: When Bigger is Not Better?”, in *Proceedings of International Workshop on Wireless Access Flexibility (WiFlex)*, Springer Lecture Notes in Computer Science (LNCS), Kaliningrad, Russia, Sept. 2013.
19. H. Feghhi, **P. Patras**, D. Malone, “Practical Node Policing in 802.11 WLANs” (demo), in *Proceedings of IEEE 14<sup>th</sup> International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Madrid, Spain, June 2013.
20. A. Giannoulis, **P. Patras**, E. Knightly, “Mobile Access of Wide-Spectrum Networks: Design, Deployment and Experimental Evaluation”, In *Proceedings of IEEE 32<sup>nd</sup> International Conference on Computer Communications (INFOCOM)*, Turin, Italy, Apr. 2013.
21. P. Salvador, S. Paris, C. Pisa, **P. Patras**, Y. Grunenberger, X. Perez-Costa, J. Gozdecki, “A modular, flexible and virtualizable framework for IEEE 802.11”, In *Proceedings of Future Network & Mobile Summit*, Berlin, Germany, July 2012.
22. **P. Patras**, H. Qi, D. Malone, “Exploiting the Capture Effect to Improve WLAN Throughput”, In *Proceedings of IEEE 13<sup>th</sup> International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, San Francisco, USA, June 2012.
23. J. Lessmann, A. de la Oliva, C. Sengul, A. Garcia, M. Kretschmer, S. Murphy, **P. Patras**, “On the Scalability of Carrier-grade Mesh Network Architectures”, In *Proceedings of Future Networks & Mobile Summit*, Warsaw, Poland, June 2011.
24. P. Serrano, **P. Patras**, X. Perez Costa, B. Gloss, D. Chieng, “A MAC Layer Abstraction for Heterogeneous Carrier Grade Mesh Networks”, In *Proceedings of ICT Mobile Summit 2009, Santander*, Spain, June 2009.
25. **P. Patras**, A. Banchs, P. Serrano, “A Control Theoretic Framework for Performance Optimization of IEEE 802.11 Networks”, In *Proceedings of IEEE 28<sup>th</sup> International Conference on Computer Communications (INFOCOM)*, Rio de Janeiro, Brazil, Apr. 2009.
26. A. Bikfalvi, **P. Patras**, C.M. Vancea, V. Dobrota, “The Management Infrastructure of a Network Measurement System for QoS Parameters”, In *Proceedings of 14<sup>th</sup> International Conference on Software, Telecommunication and Computer Networks (SoftCOM)*, Split-Dubrovnik, Croatia, Oct. 2006.

## Research Funding

2016: Co-I, GCHQ, Security and Privacy for mHealth and Wearables / Hardware Hacking Kit; grant value: £6k.

2016: PI, The Scottish Informatics & Computer Science Alliance (SICSA), Postdoctoral and Early Career Researcher Exchange (PECE) bursary; grant value: £5.3k.

2014–2015: PI, The University of Edinburgh Development Trust, Innovation Initiative Grant, *Riding Millimetre Radio Waves at Gigabit-per-second Speeds*; grant value: £4k.

2011–2013: Collaborator, European Union FP7-2009-ICT-5, *FLAVIA: FLeXible Architecture for Virtualizable future wireless Internet Access*; EC contribution: €3.6M across 11 partners; Co-ordinator: Giuseppe Bianchi, University of Rome Tor Vergata.

2009–2011: PI, Spanish Ministry of Science and Innovation individual research grant, *Quality of Service in 802.11 Mesh Networks*; acceptance rate  $\leq 20\%$ ; grant value: €55k.

2008–2010: Collaborator, European Union FP7-2008-ICT-1, *CARMEN: CARrier grade MESH Networks*; EC contribution: €3.9M across 8 partners; Co-ordinator: Arturo Azcorra, University Carlos III of Madrid.

2007–2008: Collaborator, European Union FP6-2004-IST-4, *DAIDALOS II: Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services*; EC contribution: €13.8M across 37 partners; Co-ordinator: Riccardo Pascotto, Deutsche Telekom AG.

## Media Coverage

Research on the vulnerabilities of fitness trackers featured in The Telegraph, The Times, International Business Times, Huffington Post, New York Post, The Scotsman, STV News, Channel News, Market Watch, The Inquirer, China Press, Xinhua News, The Hindu, The Pioneer.

## Teaching

Spring 2018, The University of Edinburgh, UK,

INFR11146: Internet of Things Systems, Security and the Cloud (IoTSSC).

Fall 2016, Fall 2015, Fall 2014, The University of Edinburgh, UK,

INFR09040/INFR09040: Computer Science Large Practical.

Fall 2015, The University of Edinburgh, UK,

INFR09041: Undergraduate Research Practical.

Spring 2013, National University of Ireland Maynooth,

EE402: Computer & Communications Networks.

Spring 2008, Spring 2009, University Carlos III of Madrid, Spain,

Network Infrastructure (Network and E-Business Centred Computing M.Sc. Programme).

## Postgraduate Students

2021 (expected), Margus Lind, Ph.D., The University of Edinburgh.

2020 (expected), Chaoyun Zhang, Ph.D., The University of Edinburgh.

2018 (expected), Rui Li, Ph.D., The University of Edinburgh.

2015, Sivaprakash Senapathi, M.Res., The University of Edinburgh  
(co-supervised with Mahesh Marina).

2015, Sudhanshu Janghel, M.Sc., The University of Edinburgh.

2010, Jnanesh V. Bhaganagare, M.Sc., University Carlos III of Madrid  
(co-supervised with Pablo Serrano).

## Interns

Mar. 2016 – May 2016, Daniel Licciardello, University of Catania.

Sept. 2015 – Dec. 2015, Chiara Capretti, University of Brescia.

Sept. 2014 – Feb. 2015, Nicolo Facchi, University of Brescia.

## Doctorate Exams

2017, Ph.D., School of Informatics, The University of Edinburgh, supervisor Prof. Alan Bundy.

2017, Ph.D., School of Informatics, The University of Edinburgh, supervisor Dr Rik Sarkar.

2016, Ph.D., School of Informatics, The University of Edinburgh, supervisor Prof. Jane Hillston.

2014, Ph.D., School of Informatics, The University of Edinburgh, supervisor Dr Mahesh Marina.

## Scholarly Activity

### Organising Committees

- Publicity co-chair, IEEE Wireless Communications and Networking Conference (WCNC 2018).
- Steering Committee member, ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH, 2017–present).
- Reproducibility Committee member, ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec 2017).
- Technical Programme Committee co-chair, The 10<sup>th</sup> ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH 2016), co-located with ACM MobiCom.
- Demos/Posters chair, The 9<sup>th</sup> ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH 2014), co-located with ACM MobiCom.

- Demos/Posters chair, The 11<sup>th</sup> ACM International Symposium on Mobility Management and Wireless Access (MobiWAC 2013), co-located with ACM MSWiM.
- Publication co-chair, The 13<sup>th</sup> IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2012).
- Scientific secretary, The 16<sup>th</sup> European Wireless Conference (EW 2010).

### Technical Programme Committees

- The International Conference on Computer Communications and Networks (ICCCN 2018).
- The Annual International Conference on Distributed Computing in Sensor Systems (DCOSS 2018).
- The IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM 2018, WoWMoM 2015 Demos, WoWMoM 2013, WoWMoM 2012).
- The ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH 2017).
- The IEEE Global Communications Conference (GLOBECOM 2017).
- The IEEE Vehicular Technology Conference (VTC 2017-Spring, VTC 2016-Fall, VTC 2016-Spring, VTC 2015-Fall, VTC 2015-Spring, VTC 2013-Fall, VTC 2013-Spring).
- The IEEE International Workshop on Software Defined 5G Networks (Soft5G 2016, Soft5G 2015), co-located with IEEE SoftNet.
- The IEEE/IFIP Wireless Days Conference (WD 2014, WD 2013, WD 2012).
- The IFIP International Conferences on Networking (Networking 2014, Networking 2012).
- The ACM International Symposium on Mobility Management and Wireless Access (MobiWAC 2014, MobiWAC 2013).
- The Scottish Informatics & Computer Science Alliance PhD Conference (SICSA 2014).
- The 24<sup>th</sup> Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC 2013).
- The International Workshop on Wireless Access Flexibility (WiFlex 2013).
- The International Conference on Wireless Information Networks and Systems (WINSYS 2012).
- The 5<sup>th</sup> IEEE International Workshop on Enabling Technologies and Standards for Wireless Mesh Networking (MeshTech 2011), co-located with IEEE MASS.

### Editorial Boards

- Associate Editor, IEEE Communications Letters (2017–present)
- Technical Committee member, Elsevier Computer Communications journal (2014–present)

### Reviewer

- IEEE journals: IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Vehicular Technology, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Network and Service Management, IEEE Communications Magazine, IEEE Communications Letters, IEEE Wireless Communications Letters, IEEE Signal Processing Letters;
- ACM journals: ACM Transactions on Privacy and Security, Communications of the ACM;
- PloS journals: PloS ONE;
- Elsevier journals: Computer Networks, Ad-hoc Networks, Pervasive and Mobile Computing;
- Springer journals: ACM/Springer Mobile Networks and Applications (MONET), Wireless Networks, Telecommunications Systems, Wireless Personal Communications, EURASIP Journal on Wireless Communications and Networking;
- Other journals: Journal of Communications and Networks, Ad Hoc & Sensor Wireless Networks, International Journal of Ad Hoc and Ubiquitous Computing, Hindawi Mobile Information Systems.
- Grant reviewer: The EU Framework Programme for Research and Innovation (Horizon 2020).

### Advisory Boards

- Expert Group member, NetWorld2020 European Technology Platform (2015–present)
- IoT Programme board member, The University of Edinburgh (2017–present)

- University of Edinburgh IoT Programme Board and Privacy & Security Action Group (2017–present)

### **Invited Talks (selected)**

2017, May, University of Brescia, Italy.  
 2016, Aug., Northeastern University, Boston, USA.  
 2016, July, Boston University, USA.  
 2016, July, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA.  
 2016, June, The University of Edinburgh, UK.  
 2016, May, Technical University of Darmstadt, Germany.  
 2016, May, Queen Mary University of London, UK.  
 2015, Dec., NEC Laboratories Europe, Heidelberg, Germany.  
 2015, May, Institute of Electronics, Computer and Telecommunication Engineering (IEIIT), National Research Council (CNR), Turin, Italy.  
 2015, Apr., University of Brescia, Italy.  
 2015, Mar., Institute for Digital Communications, Edinburgh, UK.  
 2015, Mar., University of Stirling, UK.  
 2014, July, NGN Multi-Service Networks workshop, Abingdon, UK.  
 2014, Mar., University of Brescia, Italy.  
 2014, Mar., University of Trento, Italy.  
 2014, Mar., University College London, UK.  
 2013, Nov., Queen Mary University of London, UK.  
 2013, May, Paris Descartes University, France.  
 2013, May, Pierre-and-Marie-Curie University, Paris, France.  
 2013, Apr., NEC Laboratories Europe, Heidelberg, Germany.  
 2013, Apr., Technical University of Darmstadt, Germany.

### **Outreach**

2017, Apr., BCS Sidney Michaelson Memorial Lecture “Wearables That Snitch on Us” at the Edinburgh International Science Festival.  
 2016, Oct.–Dec., Cisco Little BIG Awards STEM Ambassador.  
 2016, May., Most viewed writer on IEEE 802.11, Wireless Routers, and Routers topics on Quora.  
 2016, Mar., Member of the playwrights team for the “Data and the Future City” play staged at Traverse Theatre, Edinburgh.  
 2015, Mar., Organiser of the “WiFi Knots: Playing with Wireless Networking Protocols” workshop, Innovative Learning Week, The University of Edinburgh.  
 2010, Nov., Speaker at Institute IMDEA Networks Open House, Leganés, Spain.

### **University Service**

2017–present, School of Informatics Public Engagement and Outreach coordinator, University of Edinburgh.  
 2017, Shortlisting Panel member for Lecturer/Senior Lecturer/Reader in Internet of Things, University of Edinburgh.  
 2015, Search Committee member for the Chair in Cyber Security & Privacy, University of Edinburgh.  
 2014–2015, Co-ordinator of Networks group fortnightly seminar series at the University of Edinburgh.  
 2014, Jury member, Smart Data Hack, Innovative Learning Week, University of Edinburgh.  
 2012–2013, Co-ordinator of NetLab group weekly seminar series at the Hamilton Institute.  
 2009–2011, Member (elected), Telematics Engineering Dept Council, University Carlos III of Madrid.

### **Professional Memberships**

2008–present, Member of the Institute of Electrical and Electronics Engineers (IEEE).  
 2010–present, Member of the Association for Computing Machinery (ACM).

2014–present, Member of the ACM Special Interest Group on Mobility of Systems, Users, Data, and Computing (SIGMOBILE).