Jan Janak

E-mail: janakj@cs.columbia.edu
Website: https://www.cs.columbia.edu/~janakj

Education

- **Ph.D., Computer Science**, Columbia University, New York, NY **Fall 2023**
  Thesis: Towards Self-Managing Networked Cyber-Physical Systems. Advisor: Prof. Henning Schulzrinne.
- **M.Phil., Computer Science**, Columbia University, New York, NY **Spring 2019**
- **M.Sc., Computer Science**, Czech Technical University, Prague, Czech Republic **Spring 2003**
  Thesis: SIP Proxy Server Effectiveness

Interests

Internet services and protocols, cyber-physical systems (Internet of Things), programming abstractions for networked systems, software engineering, computer science education.

Teaching

- **Adjunct Assistant Professor**, Dept. of Computer Science, Columbia University **Spring 2024–Summer 2024**
  COMS W3132 Intermediate Computing in Python, Enrollment: 26 Summer 2024
  COMS W3132 Intermediate Computing in Python, Enrollment: 60 Spring 2024
- **Teaching Fellow**, Dept. of Computer Science, Columbia University **Spring 2023**
  ENGI E1006 Introduction to Computing for Engineers and Applied Scientists, Enrollment: 180 Spring 2023
- **Graduate Teaching Assistant**, Dept of Computer Science, Columbia University **Fall 2017**
  COMS W4419 ITEP - Internet Technology, Economics, and Policy, Instructor: Henning Schulzrinne Fall 2017

Honors and Awards

- **Davide Giri Memorial Prize** **May 2023**
  The Fu Foundation School of Engineering and Applied Science, Columbia University

  The Davide Giri Memorial Prize is awarded annually to a graduate student in Computer Science who has combined excellence in research results with continued outstanding efforts to promote research collaboration.
- **PhD Service Award** **May 2023**
  The Fu Foundation School of Engineering and Applied Science, Columbia University
- **Best Educational Paper Award** **March 2013**
  The 2nd GENI Research and Educational Experiment Workshop, Salt Lake City

  Paper title: WiMAX in the Classroom: Designing a Cellular Networking Hands-on Lab

Service

- **IoT 2024 TPC Member** **2024**
  https://iot-conference.org/iot2024
- **ACM SIGCOMM'23 Local Arrangements Chair** **2023**
  https://conferences.sigcomm.org/sigcomm/2023

- **IoT 2023 TPC Member** **2023**
  https://iot-conference.org/iot2023

Talks, Demos, and Posters

- **Talk: Towards Self-Managing Internet of Things Systems** **October 2022**
  Texas A&M Institute of Data Science (TAMIDS), College Station, TX
- **Talk: A Platform for Experimental Research in Critical Voice Communications** **June 2022**
  NIST PSCR 2022 The Digital Experience
- **Demo: Platform for Experimental Research in Critical Voice Communications** **June 2022**
  NIST PSCR 2022 Annual Stakeholder Meeting, San Diego, CA
- **Talk: An Analysis of Amazon Echo's Network Behavior** **December 2021**
  IEEE GlobeCom 2021, Madrid, Spain
- **Talk: Talking After Lights Out: An Ad Hoc Network for Electric Grid Recovery** **October 2021**
  IEEE SmartGridComm, Aachen, Germany
- **Poster: Towards Cyber-Physical Systems Spanning Administrative and Geographical Boundaries** **June 2021**
  2021 NSF CPS Principal Investigators' Meeting
- **Talk: Naming, Twinning, and Observing–Towards Cyber-Physical Systems Spanning Administrative and Geographical Boundaries** **June 2021**
  2021 NSF CPS Principal Investigators' Meeting
- **Talk: Social Distancing and the Internet: What Can Network Performance Measurements Tell Us?** **February 2021**
  TPRC48, Washington, DC
- **Poster: Towards Scalable, Reliable, and Resilient IoT Systems for Smart Cities** **November 2020**
  DSI Smart Cities Center Poster Session, Columbia University Data Science Institute, New York, NY
- **Poster: Alexa, How Secure Are You?** **August 2018**
  Summer Research Institute Poster Session, Barnard College, New York, NY
- **Talk: Building Distributed IoT Applications with Audio/Video Processing using WebRTC** **October 2016**
  IIT RTC 2016, Chicago, IL
- **Talk: Prototyping Distributed IoT Applications with WebRTC** **October 2016**
  IPTComm 2016, Chicago, IL
- **Poster: SECE: Sense Everything, Control Everything** **September 2016**
  NYC Media Lab Summit 2016, New York, NY
- **Poster: Smartlock: Senior Design Expo Project** **May 2015**
  Senior Design Expo, Columbia University, New York, NY
- **Talk: SECE: Connecting With the Physical World** **August 2012**
  AT&T Security Research Center, New York, NY
- **Talk: Access Control for Smart Objects** **March 2012**
  IAB Workshop on Smart Object Security, Paris, France
- **Talk: SIP Express Router** **February 2006**
  FOSDEM, Brussels, Belgium

Publications

[1] J. Janak, "Towards self-managing networked cyber-physical systems," PhD Dissertation, Columbia University, New York, NY, Dec. 2023.

[2] J. Janak, T. Tseng, A. Isaacs, and H. Schulzrinne, "An analysis of Amazon Echo's network behavior," in *2021 IEEE Global Communications Conference: IoT and Sensor Networks (Globecom2021 IoTSN)*, Madrid, Spain, Dec. 2021. [Online]. Available: https://doi.org/10.1109/GLOBECOM46510.2021.9685138.

[3] J. Janak, H. Retty, D. A. Chee, A. Baloian, and H. Schulzrinne, "Talking after lights out: An ad hoc network for electric grid recovery," in *2021 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm) (IEEE SmartGridComm'21)*, Aachen, Germany, Oct. 2021. [Online]. Available: https://doi.org/10.1109/SmartGridComm51999.2021.9632338.

[4] J. De Oliveira Moreira, A. Pasarkar, W. Chen, W. Hu, J. Janak, and H. Schulzrinne, "Social distancing and the internet: What can network performance measurements tell us?" In *TPRC48: The 48th Research Conference on Communication, Information, and Internet Policy*, Feb. 2021. DOI: 10.2139/ssrn.3748153. [Online]. Available: https://dx.doi.org/10.2139/ssrn.3748153.

[5] P. Karhula, J. Janak, and H. Schulzrinne, "Checkpointing and migration of IoT edge functions," in *Proceedings of the 2nd International Workshop on Edge Systems, Analytics and Networking*, ser. EdgeSys '19, Dresden, Germany: Association for Computing Machinery, 2019, pp. 60–65, ISBN: 9781450362757. DOI: 10.1145/3301418.3313947. [Online]. Available: https://doi.org/10.1145/3301418.3313947.

[6] J. Janak and H. Schulzrinne, "Framework for rapid prototyping of distributed IoT applications powered by WebRTC," in *2016 Principles, Systems and Applications of IP Telecommunications (IPTComm)*, Chicago, IL, USA: IEEE, Oct. 2016, pp. 1–7. DOI: 10.1109/IPTComm39427.2016.7780249.

[7] K.-H. Kim, J. W. Lee, M. Ben-Ami, H. Nam, J. Janak, and H. Schulzrinne, "Flexible network address mapping for container-based clouds," in *Proceedings of the 2015 1st IEEE Conference on Network Softwarization (NetSoft)*, Apr. 2015, pp. 1–5. DOI: 10.1109/NETSOFT.2015.7116156. [Online]. Available: https://doi.org/10.1109/NETSOFT.2015.7116156.

[8] H. Nam, J. Janak, and H. Schulzrinne, "Connecting the physical world with Arduino in SECE," Department of Computer Science, Columbia University, Tech. Rep. CUCS-013-13, May 2013. [Online]. Available: http://hdl.handle.net/10022/AC:P:20841.

[9] J. Marasevic, J. Janak, H. Schulzrinne, and G. Zussman, "WiMAX in the classroom: Designing a cellular networking hands-on lab," in *Proc. the 2nd GENI Research and Educational Experiment Workshop (GREE2013)*, Mar. 2013, pp. 104–110. DOI: 10.1109/GREE.2013.29. [Online]. Available: http://dx.doi.org/10.1109/GREE.2013.29.

[10] J. Marasevic, J. Janak, H. Schulzrinne, and G. Zussman, "WiMAX in the classroom: Designing a cellular networking hands-on lab," Department of Electrical Engineering, Columbia University, Tech. Rep. 2013-03-14, Mar. 2013. [Online]. Available: http://hdl.handle.net/10022/AC:P:19518.

[11] J. W. Lee, R. Francescangeli, W. Song, J. Janak, E. Maccherani, S. R. Srinivasan, M. Kester, S. Baset, and H. Schulzrinne, "NetServ: Reviving active networks," Department of Computer Science, Columbia University, Tech. Rep. CUCS-001-12, 2012. [Online]. Available: https://doi.org/10.7916/D8X06G48.

[12] J. Janak, J. W. Lee, and H. Schulzrinne, "GRAND: Git revisions as named data," Department of Computer Science, Columbia University, Tech. Rep. CUCS-047-11, 2011, pp. 1–6. [Online]. Available: https://doi.org/10.7916/D8445VJ2.

[13] J. W. Lee, R. Francescangeli, W. Song, J. Janak, S. Srinivasan, M. S. Kester, S. A. Baset, E. Liu, H. Schulzrinne, V. Hilt, Z. Despotovic, and W. Kellerer, "NetServ framework design and implementation 1.0," Department of Computer Science, Columbia University, Tech. Rep. CUCS-016-11, 2011. [Online]. Available: https://doi.org/10.7916/D8S75Q79.

[14] S. Seo, J. Janak, and H. Schulzrinne, "Columbia university WiMAX campus deployment and installation," Department of Computer Science, Columbia University, Tech. Rep. CUCS-032-11, 2011. [Online]. Available: http://hdl.handle.net/10022/AC:P:10685.

[15] J. W. Lee, R. Francescangeli, J. Janak, S. Srinivasan, S. Baset, H. Schulzrinne, Z. Despotovic, and W. Kellerer, "NetSerV: Active networking 2.0," in *2011 IEEE International Conference on Communications Workshop (ICC)*, IEEE, Kyoto, Japan, Jun. 2011, pp. 1–6, ISBN: 978-1-61284-953-9. [Online]. Available: http://dx.doi.org/10.1109/iccw.2011.5963554.

[16] S. A. Baset, J. Reich, J. Janak, P. Kasparek, V. Misra, D. Rubenstein, and H. Schulzrinne, "How green is IP-Telephony?" In *Proceedings of the First ACM SIGCOMM Workshop on Green Networking*, ACM, 2010, pp. 77–84, ISBN: 978-1-4503-0196-1. [Online]. Available: http://doi.acm.org/10.1145/1851290.1851306.

[17] J. W. Lee, R. Francescangeli, W. Song, J. Janak, S. Srinivasan, M. S. Kester, S. A. Baset, E. Liu, H. Schulzrinne, V. Hilt, Z. Despotovic, and W. Kellerer, "NetServ: Activating the network edge," Department of Computer Science, Columbia University, Tech. Rep., 2009. [Online]. Available: https://janakj.org/papers/netserv_edge.pdf.

[18] M. Brandl, K. Franzens, D. Daskopoulos, E. Dobbelsteijn, R. G. Garroppo, J. Janak, J. Kuthan, S. Niccolini, J. Ott, S. Prelle, S. Ubik, and E. Verharen, "IP telephony cookbook," TERENA, Tech. Rep., Mar. 2004. [Online]. Available: http://www.terena.org/activities/iptel/chapters/IPTELEPHONYCOOKBOOK.pdf.

[19] Y. Rebahi, D. Sisalem, J. Kuthan, A. Pelinescu-Oncicul, B. Iancu, J. Janak, and D.-C. Mierla, "The SIP Express Router-an open source SIP platform," in *Evolute Workshop*, Guildford, UK, 2003. [Online]. Available: http://publica.fraunhofer.de/documents/N-266892.html.

[20] A. Pelinescu-Onciul, J. Janak, and J. Kuthan, "SIP Express Router (SER)," *IEEE Network*, vol. 17, no. 4, pp. 9–9, Jul. 2003. [Online]. Available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1220689.

[21] J. Janak, "SIP proxy server effectiveness," M.S. thesis, Department of Computer Science, Czech Technical University, May 2003. [Online]. Available: https://janakj.org/papers/janakj_msc_thesis.pdf.

Work Experience

- **Senior Research Scientist** **May 2023–August 2024**
  MediaTek USA Inc., Warren, NJ
  Design and prototyping of abstractions for distributed 6G network applications.

- **Graduate Research Assistant** **September 2015–December 2022**
  Internet Real-Time Lab, Dept. of Computer Science, Columbia University, New York, NY
  Research related to cyber-physical systems, and mission-critical voice. Performed system design and prototyping; designed and evaluated network protocols, services, and APIs; supervised students.

- **Associate Research Assistant** **June 2011–August 2015**
  Internet Real-Time Lab, Dept. of Computer Science, Columbia University, New York, NY
  Research related to the Internet of Things (IoT). Performed system design and prototyping; designed and evaluated network protocols, services, and APIs; supervised students.

- **Visiting Researcher (on sabbatical)** **January 2010–June 2011**
  Internet Real-Time Lab, Dept. of Computer Science, Columbia University, New York, NY

Evaluated energy efficiency of VoIP systems, designed software for deploying services into core Internet routers (NetServ), conducted high-performance SIP signaling research.

- **Senior Software Architect** **June 2005–August 2011**
  Tekelec, Prague, Czech Republic
  Joined through the acquisition of Iptelorg. Worked on the company's carrier-grade SIP signaling products.

- **Co-Founder and Chief Software Architect** **January 2005–June 2005**
  Iptelorg GmbH, Berlin, Germany
  Oversaw the design and implementation of the company's software for large-scale VoIP deployments. Acquired by Tekelec in 2005.

- **Research Software Developer** **September 2003–December 2004**
  Fraunhofer FOKUS, Berlin, Germany
  Worked on a high-performance SIP server implementation written in C. Designed a fast protocol parser, a database access layer, an authentication abstraction API, wrote documentation.

- **Student Intern** **December 2001–December 2002**
  Fraunhofer FOKUS, Berlin, Germany
  Developed software to control NAT and firewall iptables rules from VoIP applications in real-time.