

## Jin Yu, PhD

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### Experience

**Northeastern University**, Boston, MA

- **Part-Time Faculty, Khoury College of Computer Sciences** 12/2023 –
  - Teach DS 5010 - Intro to Programming for Data Science during the spring semester and CS 6220 – Data Mining Techniques in the fall semester.

**Teradyne**, North Reading, MA

- **Head of Machine Learning** 12/2023 –
  - Lead AI transformation of semiconductor testing business unit and build a top-tier team of machine learning and data scientists.

**Philips/Signify Research**, Burlington, MA

- **Director of Machine Learning** 12/2021 – 11/2023
  - Generative AI for virtualizing lighting effect, customer review, and IP compliance.
  - Health monitoring with acoustic event detection (RNN, EfficientNet, Transformers, PHAT).
  - Utilized embedded sensors in lighting systems for smart building solutions, such as predictive management of retail queues and optimizing energy use in hotels through data analytics.
  - Partnered with Northeastern Khoury College for generative AI
  - Partnered with C2SHIP for AI-enabled elderly care program using remote sensing.
  - Partnered with MIT CSAIL: <https://cap.csail.mit.edu/engage/spotlights/signify-company>
- **IOT Data Science Manager** 01/2018 – 12/2021
  - Space management with probabilistic sensor data fusion (graphical model, message passing).
  - Large lighting IoT system diagnoses, outlier detection, and predictive maintenance.
  - Self-learning based context aware lighting system (CPC, APC, LGBM, OpenCV).
  - MIT collaboration for acoustic event detection, data fusion, collective intelligence.
- **Senior Scientist** 09/2016 – 01/2018
  - Project lead for data enabled auto commissioning algorithm design for office lighting systems.
  - System architect for two DOE projects: 1) energy optimization for office lighting; 2) Circadian lighting for patient room.

**Acuity Brands**, System Architect, Boston, MA

11/2015-09/2016

- System architecture design and development for wired and wireless mainstream dynamic lighting systems, including nLight Tunable White, Rubic gray scale and color accent, etc.

**Philips**, Firmware Engineer Lead/Research Scientist, Burlington, MA

03/2012-10/2015

- Wireless system integration and technology development with Philips Research, and product development with Philips Color Kinetics and Philips Lighting professional systems.

**Xperi Inc.**, Basking Ridge, NJ

- **Principal DSP Engineer** 11/2011-03/2012
- **Senior DSP Engineer** 09/2009-11/2011
- **DSP Engineer** 07/2008-09/2009

Key achievement: developed a joint deinterleaver and Viterbi decoder algorithm to reduce the memory requirement by 33% for HD Radio Receiver Chips to win many contracts from auto makers.

**Berkeley Varitronics Systems**, Wireless Engineer, Metuchen, NJ

09/2005-07/2008

- Software and DSP algorithm development for wireless test instruments.

## Education

- Ph.D. in Electrical & Computer Engineering, Stevens Institute of Technology, NJ 2002-2005
- B.S. in Electrical Engineering, Wuhan University, Wuhan, China 1994-1998

## Academic Activities and Industry Affiliations

- Collaborator & Continued Education, MIT CSAIL, Cambridge, MA 09/2016 – 03/2022
  - Completed seven advanced courses in ML, RL, NLP, ASR, inference, algorithms, etc.
- Vice President, IEEE Wireless & Optical Communications Conference 01/2009 – 12/2012
  - Organized/coordinated annual international conferences with over 150 global attendees.
- Adjunct Professor, Stevens Institute of Technology, Hoboken, NJ 12/2007 – 12/2009
  - Taught two courses: “Wireless Communications” and “Communication Theory.”

## Awards and Honors

- Best Friday Afternoon Exploration (FAE) Award, Signify Research, 2022
- Heroes of Context-Aware Smart Lighting, Signify, 2021
- Who’s Who in Science and Engineering, 2006-2009
- Peskin Award, Stevens Institute of Technology, 2005
- Best Paper Award, IEEE Wireless and Optical Communication Conference, 2005
- Outstanding Research Award, Stevens Institute of Technology, 2003

## Patents

1. H. You, K. Monroe, **J. Yu**, P. Deixler, “Outdoor lighting system integrated pothole detection”, Patent filed, US Patent and Trademark Office, Application No. 63/561,821, Mar 2024.
2. **J. Yu**, P. Deixler, Y. Zang, V. Robles, “Mitigation of lighting system effects on other systems”, Patent filed, US Patent and Trademark Office, Application No. 63/552,214, Feb 2024.
3. Y. Liu, Y. Zang, S. Shishehchi, **J. Yu**, “Estimation and mitigation of indoor heat island effect”, Patent filed, US Patent and Trademark Office, Application No. 63/621,652, Jan 2024.
4. **J. Yu**, P. Deixler, Y. Liu, “Method of and system for detecting vehicles”, US Patent and Trademark Office, Application No. 63/534,885, European Patent Office, Application No. 23196639.1, filed Aug 2023.
5. P. Deixler, **J. Yu**, “Luminaire with precipitation estimation”, European Patent Office, Application No. 23186581.7, US Patent and Trademark Office, Application No. 63/525174, European Patent Office, Application No. 23186581.7, filed Jul 2023.
6. **J. Yu**, P. Deixler, K. Monroe, Y. Liu, “Method and system for assessing structural integrity of street lighting luminaires”, US Patent and Trademark Office, Application No. 63/457916, European Patent Office, Application No. 23168374.9, filed Apr 2023.

7. **J. Yu**, Peter Deixler, M. M. Siraj, S. Shishehchi, H. You, “Lighting system integrated hail detection”, Patent filing, 2023.
8. **J. Yu**, P. Deixler, “Facing direction detection”, patent filing, 2023.
9. S. Shishehchi, P. Deixler, and **J. Yu**, “Using transfer learning to mitigate lack of data in image-to-image translation in lighting virtualization”, Patent filing, 2023.
10. V. Robles, **J. Yu**, P. Deixler, “Systems and methods to predict a hotel guest’s checkout time from embedded sensors in Philips Dynalite IoT systems”, patent filing, 2023.
11. **J. Yu**, K. Monroe, H. You, S. Shishehchi, P. Deixler, “System and methods to estimate gait speed and trajectory to monitor Parkinson Disease”, Patent filing, 2023.
12. **J. Yu**, P. Deixler, “A system and method for determining a sleep posture of a user during a sleep session”, US Patent and Trademark Office, Application No. 63/358504, European Patent Office, Application No. 22184843.5, WO Official File Reference: PCT/EP2023/068324, filed Jul 2023.
13. **J. Yu**, P. Deixler, M. M. Siraj, “Sensing system, method, and computer program and for event and/or human activity detection”, US Patent and Trademark Office, Application No. 63/437162, European Patent Office, Application No. 23154617.7, filed Jan 2023.
14. **J. Yu**, P. Deixler, “Lighting system integrated voice type authentication”, US Patent and Trademark Office, Application No. 63/436,982, European Patent Office, Application No. 23154714.2, filed Jul 2022.
15. Y. Zang, M. Zhao, **J. Yu**, “Systems and methods for predictive queue management using sensors embedded in connected lighting systems”, US Patent and Trademark Office, Application No. 63/397979, European Patent Office, Application No. 22195012.4, WO Official File Reference: PCT/EP2023/071783, patent filed 2022.
16. **J. Yu**, M. M. Siraj, P. Deixler, “A system and method for determining an emotional state of a user based on one or more physical and/or physiological parameters”, US Patent and Trademark Office, Application No. 63/347455, European Patent Office, Application No. 22178852.4, WO Official File Reference: PCT/EP2023/063611, filed May 2022.
17. **J. Yu**, P. Deixler, “[System and method for location obfuscation](#)”, patent published, US Patent and Trademark Office, Application No. 63/308604, European Patent Office, Application No. 22176016.8, WO Official File Reference: WO 2023156158, filed May 2022.
18. P. Deixler, **J. Yu**, “VLC based shopper and sales monitoring”, US Patent and Trademark Office, Application No. 63/388670, WO Official File Reference: PCT/EP2023/068981, filed Jul 2022.
19. P. Deixler, **J. Yu**, “System and method for tracking subjects in indoor spaces”, US Patent and Trademark Office, Application No. 63/339546, European Patent Office, Application No. 22173413.0, WO Official File Reference: PCT/EP2023/061480, filed May 2022.
20. **J. Yu**, P. Deixler, “[System for performing a sound-based sensing of a subject in a sensing area](#)”, US Patent and Trademark Office, Application No. 63/326957, European Patent Office, Application No. 22168412.9, WO Official File Reference: WO2023194167, filed Apr 2022.
21. **J. Yu**, P. Deixler, M. M. Siraj, “[Systems and Methods for Determining Device Location Properties Using Channel State Information](#)”, US Patent and Trademark Office, Application No. 63/310749, European Patent Office, Application No. 22160369.9, WO Official File Reference: WO 2023156308, filed Feb 2022.
22. A. Murthy, **J. Yu**, Y. Zang, “[Sensor system and method for monitoring a storage space](#)”, US Patent and Trademark Office, Application No. 63/296909, European Patent Office, Application No. 22151259.3, WO Official File Reference: WO 2023131555, filed Jan 2022.
23. **J. Yu**, Y. Zang, A. Murthy, P. Deixler, “[Receiving and Analyzing Consumer Behavior Data Using Visible Light Communication](#)”, US Patent and Trademark Office, Application No. 63/241254,

- European Patent Office, Application No. 21199069.2, WO Official File Reference: WO2023036665, filed Sep 2021.
24. A. Murthy, **J. Yu**, “[Systems and methods for determining a configuration of occupants in a space using sensors with single-pixel thermopiles](#)”, US Patent and Trademark Office, Application No. 63/196298, European Patent Office, Application No. 21179383.1, WO Official File Reference: WO 2022253600, filed Jun 2021.
  25. **J. Yu**, P. Deixler, “[A control device for determining a relative position of a mobile device relative to a user body and a method thereof](#)”, US Patent and Trademark Office, Application No. 63/238813, European Patent Office, Application No. 21195896.2, WO Official File Reference: WO 2023031013, filed Aug 2021.
  26. **J. Yu**, P. Deixler, “[Apparatus for controlling radiofrequency sensing](#)”, US Patent and Trademark Office, Application No. 63/229571, European Patent Office, Application No. 21191295.1, WO Official File Reference: WO 2023012033, filed Aug 2021.
  27. **J. Yu**, A. Murthy, E. Shen, F. Pijlman, P. Deixler, “System and method for determining human heart rate and/or respiration rate”, US Patent and Trademark Office, Application No. 63/158098, European Patent Office, Application No. 21162728.6, filed Mar 2021.
  28. **J. Yu**, E. Shen, P. Deixler, “[Systems and methods to detect airflow patterns using lighting embedded sensors](#)”, US Patent and Trademark Office, Application No. 63/161588, European Patent Office, Application No. 21165099.9, WO Official File Reference: WO 2022194627, filed Mar 2021.
  29. A. Murthy, Y. Yadav, **J. Yu**, P. Deixler, “[Systems and methods for disinfection of areas using connected lighting](#)”, US Patent and Trademark Office, Application No. 63/161542, European Patent Office, Application No. 21165095.5, WO Official File Reference: WO 2022194745, filed Mar 2021.
  30. **J. Yu**, M. Smith, B. Song, “[Detecting human facing directions using thermal images from embedded overhead sensors](#)”, US Patent and Trademark Office, Application No. 63/3136939, European Patent Office, Application No: 21152771.8, WO Official File Reference: WO 2022152554, filed Jan 2021.
  31. **J. Yu**, E. Shen, P. Deixler, M. Smith, “[Systems and methods for infection risk assessment and workstation recommendation](#)”, US Patent and Trademark Office, Application No. 63/114654, European Patent Office, Application No. 20212958.1, WO Official File Reference: WO 2022106279, filed Nov 2020.
  32. A. Murthy, Y. Yadav, **J. Yu**, P. Deixler, “[Systems and methods for monitoring social distancing using motion sensors](#)”, US Patent and Trademark Office, Application No. 63/093538, European Patent Office, Application No. 4229610, WO Official File Reference: WO 2022084070, filed Oct 2020.
  33. Y. Yadav, A. Murthy, **J. Yu**, P. Deixler, “[Systems and methods for monitoring face mask wearing](#)”, US Patent and Trademark Office, Application No. 63/093811, European Patent Office, Application No.: 4232945, WO Official File Reference: WO 2022084171, filed Oct 2020.
  34. **J. Yu**, Y. Yadav, A. Murthy, P. Deixler, “[Systems and methods for enforcing contact tracing](#)”, US Patent and Trademark Office, Application No. 63/067004, US-2023-0317299-A1, WO Official File Reference: WO 2022037981, filed Aug 2020.
  35. P. Deixler, **J. Yu**, “[System for controlling a sound-based sensing for subjects in a space](#)”, US Patent and Trademark Office, Application No. 63/134752, European Patent Office, Application No. 21157454.6, WO Official File Reference: WO 2022148718, filed Feb 2020.
  36. **J. Yu**, P. Deixler, “[Selection criteria for passive sound sensing in a lighting iot network](#)”, *Patent No.*, WE 4111146, US Patent and Trademark Office, Application No. 63/980472, European Patent Office, Application No.: 20194802.3, WO Official File Reference: WO2021170458, filed Aug 2020.
  37. D. Han, **J. Yu**, “[Image recognition based individual identification and localization system](#)”, WO Official File Reference: US Patent and Trademark Office, Application No. 63/070659, EP Official File Reference: 20194513.6, WO Official File Reference: 2022043008, filed Aug 2020.

38. E. Shen, **J. Yu**, “[Systems and methods for people counting using beam-forming passive infrared sensors having a dynamically configurable field of view](#)”, US Patent and Trademark Office, Application No. 63/050376, EP Official File Reference: 20186429.5, WO Official File Reference: WO 20220008340, patent filed Jul 2020.
39. **J. Yu**, J. Kaur, “[Systems, methods and apparatus for improving energy consumption efficiency of appliances serving a facility](#)”, US Patent and Trademark Office, Application No. 63/085182, EP Official File Reference: 20200668.0, WO Official File Reference: WO 2022069396, filed Sep 2020.
40. A. Murthy, R. Kumar, **J. Yu**, “[Systems and methods for fusing data from single pixel thermopiles and passive infrared sensors for counting occupants in open offices](#)”, US Patent and Trademark Office, Application No. 62/953787, EP Official File Reference: 20150400.8, WO Official File Reference: WO 2021130034, US-2023-0016414-A1, patent filed Dec 2019.
41. **J. Yu**, A. Murthy, J. Hu, D. Han, M. Smith, “[Systems and methods for collision detection using a connected lighting system](#)”, US Patent and Trademark Office, Application No. 63/790037, EP Official File Reference: 19156576.1, WO 2020144009, filed Jan 2019.
42. D. Han, J. Hu, A. Murthy, **J. Yu**, “[Systems, methods, and devices for drone detection using an outdoor lighting network](#)”, *Patent No.* WE 3908850, US-2022-0057503-A1, WO Official File Reference: WO 2020144245, US Patent and Trademark Office, Application No. 62/790039, EP Official File Reference: 19156567.0, filed Jan 2019.
43. **J. Yu**, J. Hu, X. Wang, “[System and method for automatically recommissioning a lighting node using wireless signal characteristics](#)”, *Patent No.* WE 3763169, US Patent and Trademark Office, Application No. 62/639373, EP Official File Reference: 18164890.8, EP3763169A, WO Official File Reference: WO 2019170506, filed Jan 2019.
44. D. Jiang, P. Gruijters, D. Han, **J. Yu**, Y. Zhang, “[Power saving mode optimized dual-mode cellular and short range RF transceivers](#)”, *Patent No.* 3738356, US Patent and Trademark Office, Application No. 62/615116, EP Official File Reference: 18154016.2, WO Official File Reference: WO 2019/137850 A1, patent filed Jan 2019.
45. Y. Zhang, **J. Yu**, D. Jiang, D. Han, “[System and method for end-to-end secure communication in device-to-device communication networks](#)”, *Patent No.* 3735387, US Patent and Trademark Office, Application No. 62/613439, EP Official File Reference: 18154579.9, WO Official File Reference: WO 2019134868, patent filed Jan 2019.
46. **J. Yu**, J. Warwick, T. Oliveira, “[System and method for dynamic lighting using a narrowband wireless lighting network](#)”, US Patent and Trademark Office, Application No. 62/559162, EP Official File Reference: 17194543.9, WO Official File Reference: WO 2019052873, EP 3682599, filed Sep 2018.
47. A. Murthy, **J. Yu**, “[System and method for performing building-wide wireless network intrusion detection via connected luminaires](#)”, US Patent and Trademark Office, Application No. 62/7587724, EP Official File Reference: 17205835.6, WO Official File Reference: WO 2019096785, US-2020-0351664-A1, filed Oct 2017.
48. **J. Yu**, M. Shaffer, “[Methods and apparatus for custom color transition effects](#)”, US Patent and Trademark Office, Application No. 62/147618, US-2018-0139421-A1, WO Official File Reference: WO 2016166034, filed Apr 2016.



## Papers

1. Y. Gong, **J. Yu**, and J. Glass, "[VocalSound: A Dataset for Improving Human Vocal Sounds Recognition](#)", IEEE ICASSP, 2022.
2. J. Hu, M. Smith, **J. Yu**, "[Software architecture of integrated adaptive control for human-centric office lighting systems](#)", IES Annual Conference, Aug 2017.
3. H. Li, Y. D. Yao, and **J. Yu**, "[Outage probabilities of wireless systems with LCMV beamforming.](#)" [IEEE Transactions on Wireless Communications](#), vol. 6, no. 10, pp. 3515-3523, 2007.
4. H. Li, Y. D. Yao, and **J. Yu**, "[Outage Performance of Wireless Systems with LCMV Beamforming for Dominant Interferers Cancellation](#)", IEEE ICC, 2007.
5. J. Yu, H. Li, Y.D. Yao, N.J. Vallestero, "[LPI and BER Performance of a Chaotic CDMA System Using Different Detection Structures](#)", ARMY CECOM, 2006.
6. D.J. Shyy, **J. Yu**, Y.D. Yao, "[Modeling and performance evaluation of 3G CDMA networks with beamforming](#)", Wireless Personal Communications, pp. 1-13, 2006.
7. **J. Yu**, H. Li, Y.D. Yao, N.J. Vallestero, "[LPI and BER Performance of a Chaotic CDMA System](#)", IEEE Vehicle Technology Conference, pp 1-5, 2006.
8. H. Li, Y.D. Yao, **J. Yu**, '[Outage probabilities of wireless systems with imperfect beamforming](#)', IEEE Transactions on Vehicle Technology, 1503-1514, 2006.
9. **J. Yu**, Y. D. Yao, A. F. Molisch, and J. Zhang, "[Performance evaluation of CDMA reverse links with imperfect beamforming in a multicell environment using a simplified beamforming model](#)", IEEE Trans. on Vehicular Technology, vol. 55, no. 3, pp 1019-1031, May 2006.
10. H. Li, Y.D. Yao, **J. Yu**, "[Modeling and outage probability analysis of wireless systems with imperfect beamforming](#)", IEEE VTC fall, pp.1357-1361, 2005.
11. **J. Yu** and Y. D. Yao, "[Reverse link capacity of CDMA systems with imperfect beamforming using different types of antenna arrays](#)", IEEE VTC fall, pp. 182-186, 2005.
12. **J. Yu** and Y. D. Yao, "[Outage probability of wireless systems with linear and circular antenna arrays in correlated Nakagami fading channels](#)", IEEE ICC, 2005.
13. H. Li, Y.D. Yao, **J. Yu**, "[Outage probabilities of wireless systems with beamforming](#)", IEEE WOCC, pp.1357-1361, Apr 2005.
14. **J. Yu** and Y. D. Yao, "[Secure chaotic spread-spectrum communication systems](#)", IEEE WOCC, pp.71, Apr 2005.
15. **J. Yu** and Y. D. Yao, "[Detection performance of chaotic spreading LPI waveforms.](#)" IEEE Trans. on Wireless Communications, pp.390-396, vol. 4, 2005.
16. **J. Yu** and Y. D. Yao, "[Detection performance of time-hopping ultra-wideband LPI waveforms](#)", IEEE Sarnoff Symposium on Advances in Wired and Wireless Communication, pp.137-140, Apr 2005.
17. **J. Yu**, Y. D. Yao, J. Zhang, "[Reverse-link capacity of power-controlled CDMA systems with beamforming](#)", IEEE Transactions on Vehicular Technology, pp. 1423-1433, Sep 2004.
18. **J. Yu** and Y. D. Yao, "[Error probabilities of CDMA systems with beamforming under different power control schemes](#)", IEEE 60<sup>th</sup> VTC, pp. 5285-5287, fall 2004.
19. Y.D. Yao, M. Syed, **J. Yu**, "[Utilizing beamforming for random access-a cross-layer paradigm](#)", IEEE 60<sup>th</sup> VTC, pp. 5160-5164, fall 2004.
20. D. J. Shyy, **J. Yu** and Y. D. Yao, "[Performance analysis of deploying antenna array in 3G CDMA networks](#)", IEEE 60<sup>th</sup> VTC, pp. 4260-4264, fall 2004.
21. D. J. Shyy, **J. Yu** and Y. D. Yao, "[Performance evaluation of 3G CDMA networks with antenna arrays](#)", IEEE 4<sup>th</sup> Workshop on Applications and Services in Wireless Networks, 2004.

22. **J. Yu**, Y. D. Yao, "[Evaluation of reverse link performance of a CDMA system with imperfect beamforming](#)", IEEE 59<sup>th</sup> VTC, pp.137-141, spring 2004.
23. **J. Yu**, Y. D. Yao, "[Detection performance of LPI waveforms of chaotic spread-spectrum systems with antenna arrays](#)", IEEE Sarnoff Symposium on Advances in Wired and Wireless communications", pp.99-102, Apr 2004.
24. Y Li, H Man, **J Yu**, YD Yao, "[Multipath routing in ad hoc networks using directional antennas](#)", IEEE Sarnoff Symposium on Advances in Wired and Wireless communications", pp.119-122, Apr 2004.
25. **J. Yu**, Y. D. Yao, A. F. Molisch, and J. Zhang, "[Reverse link capacity of power-controlled CDMA systems with antenna arrays in a multipath fading environment](#)", IEEE Global Telecommunications Conference, pp 1019-1031, May 2003.
26. **J. Yu**, Y. D. Yao, "[Reverse link capacity of SIR-based power-controlled CDMA systems with antenna arrays](#)", Wireless Communications and Mobile Computing, Vol. 3, pp. 759-772, 2003.
27. **J. Yu**, Y. D. Yao, "[CDMA reverse link capacity with antenna arrays in a multipath fading environment](#)", 6<sup>th</sup> International Symposium on Antennas, Propagation, and EM Theory, pp.311-314, 2003.
28. **J. Yu** and A. A. Kishk, "[Wavelets transform of the method of moments matrix arising from electromagnetic scattering from 2D objects](#)", 9<sup>th</sup> International Symposium on Antenna Technology and Applied Electromagnetics, pp.1-4, 2002.
29. **J. Yu** and A. A. Kishk, "[Use of wavelet transform to the Method of Moment matrix arising from electromagnetic scattering problems of 2D objects due to oblique plane wave incidence](#)," Microwave and Optical Technology Letters, vol. 34, no. 2, pp. 130-134, July 2002.
30. **J. Yu** and A. A. Kishk, "[Extension of impedance matrix compression method with wavelet transform for 2-D conducting and dielectric scattering objects due to oblique plane wave incidence](#)," Microwave and Optical Technology Letters, vol. 34, no. 1, pp. 53-56, July 2002.