Dr. Prasanna Date

Research Scientist

Computer Science & Mathematics
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ORNL Webpage
Personal Webpage

Profiles

LinkedIn
Twitter
ResearchGate
ORCID
Google Scholar
GitHub

Interests

- Artificial Intelligence
- Machine Learning
- Deep Learning
- Quantum Computing
- Neuromorphic Computing
- Applied Operations Research

Biography

Dr. Prasanna Date is a Research Scientist at the Oak Ridge National Laboratory (ORNL). He explores AI and machine learning techniques on non-conventional computing platforms such as quantum computing and neuromorphic computing. He obtained his Ph.D. in Computer Science at Rensselaer Polytechnic Institute in 2019. He is a member of ACM, APS, IEEE and INFORMS.

Experience

Sep 2019 – Present
Research Scientist — **Oak Ridge National Laboratory, Oak Ridge, TN**
- Part of the Computer Science and Mathematics Division (CSMD).
- Pursued research in quantum computing, neuromorphic computing, artificial intelligence and machine learning; organized conferences and workshops; led research projects, delivered talks, mentored students, took up editorship and peer review responsibilities etc.

May 2019 – Sep 2019, Aug 2018 – Dec 2018, May 2015 – Dec 2017
Research Assistant — **Rensselaer Polytechnic Institute, Troy, NY**
- Worked in the research group of Prof. Christopher D. Carothers.
- Pursued research in neuromorphic computing and deep learning: (1) CoNNTrA training algorithm for neuromorphic spiking neural networks; (2) Predicting supercomputer failures using neuromorphic computing; and, (3) Design index for deep neural networks.
- Highlights: 1 doctoral dissertation, 3 conference papers and 2 invited talks.

Jan 2018 – Aug 2018
Research Intern — **Oak Ridge National Laboratory, Oak Ridge, TN**
- Part of the Computational Data Analytics (CDA) Group, mentored by Dr. Robert M. Patton.
- Pursued research in quantum computing and machine learning.
- Highlights: 1 journal paper and 1 conference paper.

Education

2014–2019
Ph.D. Computer Science — **Rensselaer Polytechnic Institute, Troy, NY**
Dissertation: *Combinatorial Neural Network Training Algorithm for Neuromorphic Computing*
Advisor: Prof. Christopher D. Carothers
GPA: 3.9 / 4.0
Neuromorphic Computing | Deep Learning | HPC

2014–2019
M.S. Computer Science — **Rensselaer Polytechnic Institute, Troy, NY**
GPA: 3.9 / 4.0
Machine Learning | Data Mining | Randomized Algorithms

2014–2019
M.Eng. Industrial Engineering — **Rensselaer Polytechnic Institute, Troy, NY**
GPA: 3.8 / 4.0
Operations Research | Combinatorial Optimization

2010–2014
B.E. (Honors) Manufacturing Engineering — **BITS Pilani, India**
Thesis: *Development of Fuzzy PROMETHEE Algorithm for Evaluation of Indian World Class Manufacturing Organizations*
Supervisor: Prof. Abhijeet K. Digalwar
CGPA: 8.0 / 10.0
Algorithm Design | Fuzzy Logic | Supply Chain Management

Skills

Programming & Machine Learning:

- Python, C, C++ ●●●●○
- TensorFlow ●●●●○
- Scikit-learn ●●●●○
- MATLAB, R ●●●○○

Quantum Computing:

- Google, IBM, D-Wave ●●●●○
- Rigetti, Xanadu ●●●○○

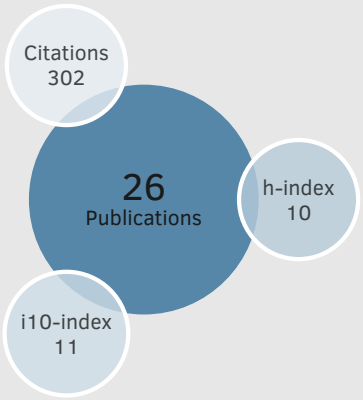
Neuromorphic Computing:

- Intel Loihi ●●●●○
- IBM TrueNorth ●●●●○

Web Development:

- HTML, CSS, JavaScript ●●●○○

Metrics



Memberships

ACM: Association for Computing Machinery

APS: American Physical Society

IEEE: Institute of Electrical and Electronics Engineers

INFORMS: Institute for Operations Research and the Management Sciences

Languages

English (Fluent)

Hindi (Fluent)

Marathi (Mother Tongue)

Projects

Oct 2020 – Jun 2021 — **General-Purpose Neuromorphic Computing** — **ORNL**
- *Description*: Prove Turing-completeness of neuromorphic computing. Develop theoretical models of neuromorphic computational complexity. Design general-purpose neuromorphic algorithms.
- *Resources & Languages*: Intel Loihi neuromorphic system, NEST neuromorphic simulator, Python

Jul 2020 – Sep 2021 — **Quantum Machine Learning** — **ORNL**
- *Description*: Demonstrate the efficacy of quantum computers to train machine learning models and compare performance to classical computers.
- *Resources & Languages*: IBM, Rigetti and Xanadu quantum computers, Google Cirq, IBM Qiskit, Rigetti Forest, Xanadu PennyLane

Apr 2020 – Sep 2020 — **Epidemiological Modeling using Neuromorphic Computing** — **ORNL**
- *Description*: Develop spike-based neuromorphic models for epidemiological simulations of global pandemics such as COVID-19.
- *Resources & Languages*: NEST neuromorphic simulator, Python

Sep 2019 – Jun 2020 — **Quantum Artificial Intelligence** — **ORNL**
- *Description*: Leverage quantum computing to design efficient algorithms that can train machine learning models. Leverage quantum computers to address NP-complete problems.
- *Resources & Languages*: D-Wave 2000Q quantum computer, Python

Awards & Grants

May 2022 — **2022 Forbes 30 Under 30 Asia Honoree** — **Forbes**
- *Honor*: Featured on the 2022 Forbes 30 Under 30 Asia list.
- *Category*: Healthcare and Science.
- *Details*: For contributions in quantum machine learning and neuromorphic computing.

Dec 2021 — **Promising Early-Career Researcher Award** — **CSMD ORNL**
- *Details*: For contributions both broad and deep during his first two years as an ORNL staff member.
- *Division*: Computer Science and Mathematics Division

June 2021 — **Winner, YSiaN 2021 Competition** — **ORNL**
- *Competition*: Your Science in a Nutshell (YSiaN) 2021 is an intra-ORNL competition, where early career researchers compete against each other by presenting their research in 2 minutes. The best speaker wins the competition.
- *Talk Title*: Advancing Science using Quantum Machine Learning
- *Venue*: ORNL / Virtual

Mar 2021– Sep 2021 — **Award Recipient, AWS Research Credits** — **Amazon AWS**
- *Award*: Awarded **USD 10,000** worth of research credits, which grant access to some of the world's most advanced quantum computers, including D-Wave, Rigetti and IonQ.
- *Title*: Machine Learning Acceleration using Quantum Computing (MAQ)
- *Program*: Amazon AWS (Amazon Web Services) Cloud Credits for Research Program

Jul 2020 – Sep 2021 — **Principal Investigator** — **ORNL**
- *Title*: Machine Learning Acceleration using Quantum Computing (MAQ)
- *Program*: ORNL Laboratory Directed Research and Development (LDRD) Seed Program
- *Amount:* **USD 190,000**

Apr 2020 – Sep 2020 — **Co-Principal Investigator** — **ORNL**
- *Title*: Tracking COVID-19 in the Absense of Testing
- *Program*: ORNL Laboratory Directed Research and Development (LDRD) Seed Program
- *Amount*: **USD 190,000**

Leadership

Sep 2022 — **Workshop Chair** — **IEEE QAI 2022 Workshop**
- *Workshop*: Quantum Artificial Intelligence (QAI) Workshop, held as part of the IEEE Quantum Week: IEEE International Conference on Quantum Computing and Engineering (QCE) 2022
- *Venue*: Denver, Colorado and Virtual

Aug 2022 — **Advisor** — **EPRI**
- *Challenge*: The Electric Power Research Institute (EPRI) Quantum Challenge
- *Details*: Served as an advisor for the EPRI Quantum Challenge. Reviewed proposals and made recommendations for organizing/conducting the challenge.
- *Venue*: Virtual

Jul 2022 — **Organizing Committee Member** — **ICONS 2022 Conference**
- *Conference*: International Conference on Neuromorphic Systems (ICONS) 2022
- *Venue*: Knoxville, Tennessee

Oct 2021 — **Workshop Chair** — **IEEE QAI 2021 Workshop**
- *Workshop*: Quantum Artificial Intelligence (QAI) Workshop, held as part of the IEEE Quantum Week: IEEE International Conference on Quantum Computing and Engineering (QCE) 2021
- *Venue*: Virtual

Oct 2021 – Mar 2022 — **Leadership Engagement Chair** — **ORNL**
- *Organization*: The Future Leaders Network at ORNL, which connects early career researchers at ORNL through networking, training and leadership engagement opportunities
- *Responsibilities*: Organized Leadership Panel Series

Jul 2021 — **Organizing Committee Member** — **ICONS 2021 Conference**
- *Conference*: International Conference on Neuromorphic Systems (ICONS) 2021
- *Venue*: Virtual

Jul 2021 — **Session Chair: Lightening Talks on Hardware** — **ICONS 2021 Conference**
- *Conference*: International Conference on Neuromorphic Systems (ICONS) 2021
- *Venue*: Virtual

Oct 2020 — **Workshop Chair** — **IEEE AQAI 2020 Workshop**
- *Workshop*: Applied Quantum Artificial Intelligence (AQAI) Workshop, held as part of the IEEE Quantum Week: IEEE International Conference on Quantum Computing and Engineering (QCE) 2020
- *Venue*: Denver, Colorado / Virtual

Sep 2020 — **Breakout Session Facilitator** — **NITRD Extreme Heterogeneity Software**
- *Workshop*: Software in the Era of Extreme Heterogeneity
- *Venue*: Virtual

Jul 2020 — **Organizing Committee Member** — **ICONS 2020 Conference**
- *Conference*: International Conference on Neuromorphic Systems (ICONS) 2020
- *Venue*: Chicago, Illinois / Virtual

Jul 2020 — **Conference Session Chair** — **ICONS 2020 Conference**
- *Conference*: International Conference on Neuromorphic Systems (ICONS) 2020
- *Session*: Poster Session
- *Venue*: Chicago, Illinois / Virtual

Mar 2020 — **Workshop Track Co-Chair** — **DOE 5GEEIW Workshop**
- *Workshop*: U.S. Department of Energy 5G Enabled Energy Innovation Workshop (5GEEIW)
- *Track*: Software Architectures
- *Venue*: Chicago, Illinois

Nov 2018 — **Conference Session Chair** — **IEEE SSCI 2018 Conference**
- *Conference*: IEEE Symposium Series on Computational Intelligence (SSCI) 2018
- *Session*: Symposium on Neuromorphic Cognitive Computing
- *Venue*: Bangalore, India

Aug 2018 – Jul 2019 — **Graduate Curriculum Committee (GCC) Member** — **RPI CS Department**
- Elected into GCC by about 100 graduate students in the Computer Science (CS) department at Rensselaer Polytechnic Institute (RPI).
- Improved curriculum, degree requirements and policies for masters and doctoral programs in Computer Science.
- Assisted graduate students with curriculum-related and degree requirements issues.

Publications

Journal Publications

1. Aimone, James, **Prasanna Date**, Gabriel Fonseca-Guerra, Kathleen Hamilton, Kyle Henke, Bill Kay, Garrett Kenyon et al. "A review of non-cognitive applications for neuromorphic computing." Neuromorphic Computing and Engineering (2022).
2. Schuman, Catherine D., Shruti R. Kulkarni, Maryam Parsa, J. Parker Mitchell, **Prasanna Date** and Bill Kay. "Opportunities for neuromorphic computing algorithms and applications." Nature Computational Science 2, no. 1 (2022): 10-19.
3. **Date, Prasanna**, Catherine Schuman, Bill Kay, and Thomas Potok. "Neuromorphic Computing is Turing-Complete." *arXiv preprint arXiv:2104.13983* (2021). Accepted at International Conference on Neuromorphic Systems (ICONS) 2022.
4. **Date, Prasanna**, and Thomas Potok. "Adiabatic quantum linear regression." Scientific Reports 11, no. 1 (2021): 1-10.
5. Arthur, Davis, and **Prasanna Date**. "Balanced k-means clustering on an adiabatic quantum computer." *Quantum Information Processing* 20, no. 9 (2021): 1-30."
6. **Date, Prasanna**, Davis Arthur, and Lauren Pusey-Nazzaro. "QUBO formulations for training machine learning models." *Scientific Reports* 11, no. 1 (2021): 1-10.
7. **Date, Prasanna**, Robert Patton, Catherine Schuman, and Thomas Potok. "Efficiently embedding QUBO problems on adiabatic quantum computers." *Quantum Information Processing* 18, no. 4 (2019): 117.
8. Digalwar, Abhijeet K., and **Prasanna A. Date**. "Development of fuzzy PROMETHEE algorithm for the evaluation of Indian world-class manufacturing organisations." *International Journal of Services and Operations Management* 24, no. 3 (2016): 308-330.

Conference Publications

1. Arthur, Davis and **Prasanna Date**. "A hybrid quantum-classical neural network architecture for binary classification." arXiv preprint arXiv:2201.01820 (2022). Accepted at IEEE Quantum Week 2022.
2. Quiroga, David, **Prasanna Date** and Raphael Pooser, "Discriminating Quantum States with Quantum Machine Learning," 2021 International Conference on Rebooting Computing (ICRC), 2021, pp. 56-63, doi: 10.1109/ICRC53822.
3. **Date, Prasanna**, Bill Kay, Catherine Schuman, Robert Patton, and Thomas Potok. "Computational Complexity of Neuromorphic Algorithms." In *International Conference on Neuromorphic Systems 2021*, pp. 1-7. 2021.
4. Kay, Bill, Catherine Schuman, Jade O'Connor, **Prasanna Date**, and Thomas Potok. "Neuromorphic Graph Algorithms: Cycle Detection, Odd Cycle Detection, and Max Flow." In *International Conference on Neuromorphic Systems 2021*, pp. 1-7. 2021.
5. Patton, Robert, Catherine Schuman, Shruti Kulkarni, Maryam Parsa, J. Parker Mitchell, N. Quentin Haas, Christopher Stahl, Spencer Paulissen, **Prasanna Date**, Thomas Potok and Shay Sneider. "Neuromorphic Computing for Autonomous Racing." In *International Conference on Neuromorphic Systems 2021*, pp. 1-5. 2021.
6. **Date, Prasanna**, Christopher D. Carothers, John E. Mitchell, James A. Hendler, and Malik Magdon-Ismail. "Training Deep Neural Networks with Constrained Learning Parameters." In *IEEE International Conference on Rebooting Computing (ICRC) 2020*.
7. Hamilton, Kathleen, Tiffany Mintz, **Prasanna Date**, and Catherine D. Schuman. "Spike-based graph centrality measures." In *International Conference on Neuromorphic Systems 2020*, pp. 1-8. 2020.
8. Hamilton, Kathleen, **Prasanna Date**, Bill Kay, and Catherine Schuman D. "Modeling epidemic spread with spike-based models." In *International Conference on Neuromorphic Systems* 2020, pp. 1-5. 2020.
9. Schuman, Catherine D., J. Parker Mitchell, J. Travis Johnston, Maryam Parsa, Bill Kay, **Prasanna Date**, and Robert M. Patton. "Resilience and robustness of spiking neural networks for neuromorphic systems." In *2020 International Joint Conference on Neural Networks (IJCNN)*, pp. 1-10. IEEE, 2020.
10. Parsa, Maryam, Catherine D. Schuman, **Prasanna Date**, Derek C. Rose, Bill Kay, J. Parker Mitchell, Steven R. Young et al. "Hyperparameter optimization in binary communication networks for neuromorphic deployment." In *2020 International Joint Conference on Neural Networks (IJCNN)*, pp. 1-9. IEEE, 2020.
11. **Date, Prasanna**, Catherine Schuman, Robert Patton, and Thomas Potok. "A classical-quantum hybrid approach for unsupervised probabilistic machine learning." In *Future of Information and Communication Conference*, pp. 98-117. Springer, Cham, 2019.
12. **Date, Prasanna**, Christopher D. Carothers, James A. Hendler, and Malik Magdon-Ismail. "Efficient classification of supercomputer failures using neuromorphic computing." In *2018 IEEE Symposium Series on Computational Intelligence (SSCI)*, pp. 242-249. IEEE, 2018.
13. **Date, Prasanna**, James A. Hendler, and Christopher D. Carothers. "Design index for deep neural networks." *Procedia Computer Science* 88 (2016): 131-138.

Publications (continued)

Workshop Publications

1. Schuman, Catherine D., Bill Kay, **Prasanna Date**, Ramakrishnan Kannan, Piyush Sao, and Thomas E. Potok. "Sparse Binary Matrix-Vector Multiplication on Neuromorphic Computers." In *2021 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pp. 308-311. IEEE, 2021.
2. Kay, Bill, **Prasanna Date**, and Catherine Schuman. "Neuromorphic Graph Algorithms: Extracting Longest Shortest Paths and Minimum Spanning Trees." In Proceedings of the *Neuro-inspired Computational Elements Workshop*, pp. 1-6. 2020.

Other

1. **Date, Prasanna**, Shruti Kulkarni, Aaron Young, Catherine Schuman, Thomas Potok, and Jeffrey Vetter. "Encoding Integers and Rationals on Neuromorphic Computers using Virtual Neuron." arXiv preprint arXiv:2208.07468 (2022).
2. Delgado, Andrea, Kathleen E. Hamilton, **Prasanna Date** Jean-Roch Vlimant, Duarte Magano, Yasser Omar, Pedrame Bargassa, Anthony Francis et al. "Quantum Computing for Data Analysis in High-Energy Physics." arXiv preprint arXiv:2203.08805 (2022).
3. Humble, Travis S., Andrea Delgado, Raphael Pooser, Christopher Seck, Ryan Bennink, Vicente Leyton-Ortega, Joseph Wang, Eugene Dumitrescu, Titus Morris, Kathleen Hamilton, Dmitry Lyakh, **Prasanna Date** et al. "Snowmass White Paper: Quantum Computing Systems and Software for High-energy Physics Research." arXiv preprint arXiv:2203.07091 (2022).
4. Hamilton, Kathleen, Bill Kay, **Prasanna Date**, Raphael Pooser, Travis Humble, and Catherine Schuman. "Simulating network dynamics with neuromorphic hardware." In *2022 Joint Mathematics Meetings (JMM 2022)*. AMS, 2022.
5. Quiroga, David, Prasanna Date, and Raphael Pooser. "Discriminating Quantum States with Quantum Machine Learning." In 2021 IEEE International Conference on Quantum Computing and Engineering (QCE), pp. 481-482. IEEE, 2021.
6. Chen, Jie, **Prasanna Date**, Nicholas Chancellor, Mohammed Atiquzzaman, and Cormac Sreenan. "Controller-based Energy-Aware Wireless Sensor Network Routing using Quantum Algorithms." *arXiv preprint arXiv:2110.06321* (2021). Submitted to IEEE Transactions on Quantum Engineering.
7. Chen, Jie, Prasanna Date, Nicholas Chancellor, Atiquzzaman Mohammed, Hongjian Sun, Cormac Sreenan, and Viv Kendon. "Energy Efficient Mobile Network Routing using Hybrid Quantum Algorithm." In APS March Meeting Abstracts, vol. 2021, pp. A34-008. 2021.
8. **Date, Prasanna**. "Quantum Discriminator for Binary Classification." arXiv preprint arXiv:2009.01235 (2020).
9. Pusey-Nazzaro, Lauren and **Prasanna Date**. "Adiabatic Quantum Optimization Fails to Solve the Knapsack Problem." *arXiv preprint arXiv:2008.07456* (2020).
10. **Date, Prasanna**. "Combinatorial Neural Network Training Algorithm for Neuromorphic Computing." PhD diss., Rensselaer Polytechnic Institute, 2019.

Invited Talks & Presentations

Invited Talks

1. **Guest Lecture**: "Linear Algebra for Data Science" at the National Institute of Industrial Engineering (NITIE), Mumbai, India. August 2022, virtual.
2. **Invited Talk**: "Quantum Machine Learning Techniques" at University of Washington at Seattle, as part of the Computational Research Leadership Council (CRLC) Seminar Series, hosted by the Sustainable Horizons Institute (SHI), a non-profit organization dedicated to building sustainable and inclusive scientific communities. October 2021, virtual.
3. **Invited Talk**: "Advancing Science using Quantum Machine Learning" at ORNL Computing and Computational Sciences Directorate (CCSD) Science Research Seminar. Hosted by Dr. Barney Maccabe, Division Director at ORNL. July 2021, virtual.
4. **Guest Lecture**: "Introduction to Quantum Computing" at RPI Summer School on Advanced Cyberinfrastructure Training for Modeling Physical Systems. Joel Giedt, Professor at RPI. July 2021, virtual.
5. **Guest Lecture**: "Introduction to Neuromorphic Computing" at RPI Summer School on Advanced Cyberinfrastructure Training for Modeling Physical Systems. Joel Giedt, Professor at RPI. July 2021, virtual.
6. **Guest Lecture**: "Quantum Artificial Intelligence" at RPI Summer School on Advanced Cyberinfrastructure Training for Modeling Physical Systems. Hosted by Prof. Joel Giedt, Professor at RPI. July 2020, virtual.
7. **Invited Talk**: "Adiabatic Quantum Linear Regression" at ORNL's Quantum Machine Learning (QML) Club. Hosted by Dr. Ryan Bennink. July 2019, virtual.
8. **Invited Talk**: "A Classical-Quantum Hybrid Approach for Unsupervised Probabilistic Machine Learning" at 120th Topical Symposium of the APS New York State Section: Physics of Artificial Intelligence. Hosted by Dr. Abram Falk, Research Staff Member at IBM. April 2019, Yorktown Heights, New York.
9. **Invited Talk**: "A Classical-Quantum Hybrid Approach for Unsupervised Probabilistic Machine Learning" at RPI Physics Department Seminar. Hosted by Prof. Joel Giedt. Spring 2019, Troy, New York.

Invited Talks & Presentations (continued)

Presentations

1. **Conference Presentation**: "Computational Complexity of Neuromorphic Algorithms" at International Conference on Neuromorphic Systems (ICONS) 2021. July 2021, virtual.
2. **Conference Presentation**: "Training Deep Neural Networks with Constrained Learning Parameters" at IEEE International Conference on Rebooting Computing (ICRC) 2020. October 2020, virtual.
3. **Workshop Presentation**: "Quantum Encrypted Communication over 5G Networks for Autonomous Vehicles" at U.S. Department of Energy (DOE) 5G Enabled Energy Innovation Workshop (5GEEIW). March 2020, Chicago, Illinois.
4. **Conference Presentation**: "A Classical-Quantum Hybrid Approach for Unsupervised Probabilistic Machine Learning" at Future of Information and Communication Conference 2019. March 2019, San Francisco, California.
5. **Conference Presentation**: "Efficient Classification of Supercomputer Failures using Neuromorphic Computing" at IEEE Symposium Series on Computational Intelligence (SSCI) 2018. November 2018. Bangalore, India.
6. **Conference Presentation**: "Efficiently Embedding QUBO Problems on Adiabatic Quantum Computers" at D-Wave Qubits North America Quantum Computing Users Conference. September 2018, Knoxville, Tennessee.
7. **Conference Presentation**: "Design Index for Deep Neural Networks" at Biologically Inspired Cognitive Architectures (BICA) 2016. July 2016, New York City, New York.

Posters and Abstracts

1. "A Classical-Quantum Hybrid Approach for Unsupervised Probabilistic Machine Learning" at D-Wave Qubits North America Quantum Computing Users Conference. September 2018, Knoxville, Tennessee.
2. "Efficient Classification of Supercomputer Failures" at International Conference on Neuromorphic Systems (ICONS) 2018. July 2018, Knoxville, Tennessee.

Editorship & Peer Review

Editorship

1. *Associate Editor*: **Transactions on Neural Networks and Learning Systems** | Impact Factor: 8.8
2. *Editorial Board Member*: **Nature Scientific Reports** | Impact Factor: 5.0
3. *Review Editor*: **Frontiers in Systems Neuroscience** | Impact Factor: 3.3

Peer Reviewed Journals

1. *Reviewer*: **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)** | Impact Factor: 8.8
2. *Reviewer*: **Nature Communications Physics** | Impact Factor: 8.1
3. *Reviewer*: **Nature Scientific Reports** | Impact Factor: 4.4
4. *Reviewer*: **IEEE Transactions on Computers** | Impact Factor: 3.1
5. *Reviewer*: **Physical Review A** | Impact Factor: 3.0
6. *Reviewer*: **Physical Review E** | Impact Factor: 2.7
7. *Reviewer*: **Public Library of Science (PLOS) One** | Impact Factor: 2.7
8. *Reviewer*: **Springer Quantum Information Processing (QIP)** | Impact Factor: 2.4
9. *Reviewer*: **IEEE Transactions on Quantum Engineering (TQE)** | Impact Factor: 2.3
10. *Reviewer*: **World Scientific International Journal of Quantum Information (IJQI)** | Impact Factor: 1.2

Conferences

1. *Program Committee Member*: **International Conference on Neuromorphic Systems (ICONS) 2022**
2. *Reviewer*: **International Conference on Machine Learning (ICML) 2022**
3. *Program Committee Member*: **International Conference on Neuromorphic Systems (ICONS) 2021**
4. *Program Committee Member*: **International Conference on Neuromorphic Systems (ICONS) 2020**
5. *Program Committee Member*: **International Conference on Neuromorphic Systems (ICONS) 2018**
6. *Reviewer*: **IEEE International Conference on Artificial Intelligence Circuits and Systems (AICAS) 2021**

Workshops

1. *Program Committee Chair*: **IEEE Applied Quantum Artificial Intelligence (AQAI) Workshop 2020**
2. *Program Committee Member*: **International Workshop on COmputing using EmeRging EXotic AI-Inspired Systems (CORtEX 22)**

Quantum Artificial Intelligence

Quantum Machine Learning

Quantum Neural Networks

Quantum Support Vector Machine

Quantum Regression

Teaching

Aug 2022 — **Guest Lecturer** — **NITIE, Mumbai, India**
- *Topic*: Linear Algebra for Data Science
- *Platform*: As part of the 'Data Science for Business Applications' course taught at the National Institute of Industrial Engineering (NITIE), Mumbai.
- *Host*: Prof. Hema Date

Jul 2021 — **Guest Lecturer** — **Rensselaer Polytechnic Institute, Troy, NY**
- *Topic*: Introduction to Quantum Computing
- *Platform*: Summer School on 'Advanced Cyberinfrastructure Training for Modeling Physical Systems 2021'
- *Host*: Prof. Joel Giedt

Jul 2021 — **Guest Lecturer** — **Rensselaer Polytechnic Institute, Troy, NY**
- *Topic*: Introduction to Neuromorphic Computing
- *Platform*: Summer School on 'Advanced Cyberinfrastructure Training for Modeling Physical Systems 2021'
- *Host*: Prof. Joel Giedt

Jun 2020 — **Guest Lecturer** — **Rensselaer Polytechnic Institute, Troy, NY**
- *Topic*: Quantum Artificial Intelligence
- *Platform*: Summer School on 'Advanced Cyberinfrastructure Training for Modeling Physical Systems 2020'
- *Host*: Prof. Joel Giedt

Jan 2019 – May 2019, Aug 2014 – May 2015 — **Teaching Assistant** — **Rensselaer Polytechnic Institute, Troy, NY**
- *Courses*: Parallel Computing, Big Data Analytics, Optimization Algorithms and Applications, Decision Focussed Systems Engineering
- *Duties*: Graded assignments, conducted office hours, mentored graduate and undergraduate students

Mentoring

May 2022 – Aug 2022 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Amish Mishra
- *Project*: Quantum Topological Data Analysis. Amish won the Ignite-Off 2022 competition at the national level for the research work pursued during his internship.
- *Program*: NSF Mathematical Sciences Graduate Internship (MSGI) program

May 2022 – Aug 2022 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Modeste Kenne
- *Project*: Neuromorphic Computing for Optimization Problems
- *Program*: The National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM) Fellowship

May 2022 – Aug 2022 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Dong Jun Woun
- *Project*: Adiabatic Quantum Support Vector Machines (QSVM)
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2021 – Aug 2021 — **Tech Talk Coach** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Students*: Joseph Schmidt, University of Texas at Austin; Clarice Phelps, University of Tennessee at Knoxville; Edward Ruiz, Columbia University; Amy Moreno, New York University
- *Task*: Coached four GEM students in preparing their research talks for a 5-minute Tech Talk competition held at ORNL.
- *Program*: The National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM) Fellowship

Jun 2021 – Aug 2021 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Wyatt Smith
- *Project*: Supervised Learning using the Quantum Discriminator
- *Program*: Pathways to Computing Internship Program (PCIP) at ORNL

Jun 2021 – Aug 2021 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Davis Arthur
- *Project*: Empirical Evaluation of Quantum Neural Networks (QNN)
- *Program*: Virtual Undergraduate Research Summer Internship (vURSI) at ORNL

Mentoring (continued)

Jun 2021 – Aug 2021 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Devon Delgado
- *Project*: Empirical Evaluation of Adiabatic Quantum Support Vector Machines (QSVM)
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2021 – Aug 2021 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Lucas Moynihan
- *Project*: Review of Support Vector Machines (SVM) on Universal Quantum Computers
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2020 – Aug 2020 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: David Quiroga, Universidad de Antioquia, Columbia
- *Project*: Clustering quantum states for efficient quantum signal propagation
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2020 – Aug 2020 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Benjamin Hansen, Brigham Young University, Idaho
- *Project*: Financial portfolio optimization using quantum computing
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2020 – Aug 2020 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Davis Arthur, Auburn University, Alabama
- *Project*: Balanced k-Means Clustering on an Adiabatic Quantum Computer
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Jun 2020 – Aug 2020 — **Research Mentor** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- *Student*: Lauren Pusey-Nazzaro, Washington University in St. Louis, Missouri
- *Project*: Adiabatic Quantum Optimization Fails to Solve the Knapsack Problem
- *Program*: U.S. Department of Energy Science Undergraduate Laboratory Internship (SULI)

Volunteering

July 2021 – September 2021 — **IEEE Computer Society EITBoK Reviewer** — **IEEE**
- Reviewed the IEEE Computer Society's Enterprise Information Technology Body of Knowledge (EITBoK), which defines the key knowledge areas for the IT profession and embodies concepts that are recognized as good practice in the IT domain and that are applicable to most IT efforts
- *Organizer*: IEEE Computer Society EITBoK

June 2021 – Present — **IEEE.tv Ambassador** — **IEEE**
- Promoted, publicized and contributed to the IEEE.tv internet television network
- *Organizer*: IEEE.tv, which is an award winning internet television network by IEEE

June 2021 – Present — **IEEE Puzzlers Volunteer** — **IEEE**
- Designed math, logic and verbal puzzles for the IEEE Puzzlers Program
- *Organizer*: IEEE Puzzlers Program

March 2021 — **Back-Up Moderator** — **Tennessee Science Bowl (TSB)**
- Served as the Back-Up Moderator in the 2021 edition of the Tennessee Science Bowl (TSB).
- *Organizer*: Oak Ridge Institute for Science and Education (ORISE)

Oct 2020 – Dec 2020 — **Co-Leader, Movie/TV/Streaming Community Group** — **Oak Ridge National Laboratory, Oak Ridge, TN**
- Virtually led the Movie/TV/Streaming Community Group, comprising of 20 people at ORNL during COVID-19.
- Conducted discussion sessions about movies, TV and streaming, organized weekly meetings, supervised fun activities such as movie-related quizzes.

Extra-Curricular

Oct 2018 **Brown University Ballroom Competition** **Providence, RI**
- *Award*: **Second Place** in Ballroom Dancing Team Event
- *Organizer*: Brown University

Oct 2018 **Princeton Ballroom Competition** **Princeton, NJ**
- *Award*: **Third Place** in Latin Rumba
- *Organizer*: Princeton University

Oct 2018 **Princeton Ballroom Competition** **Princeton, NJ**
- *Award*: **Fourth Place** in Rhythm Rumba
- *Organizer*: Princeton University

Oct 2018 **Princeton Ballroom Competition** **Princeton, NJ**
- *Award*: **Fifth Place** in Latin Jive
- *Organizer*: Princeton University

Oct 2018 **Princeton Ballroom Competition** **Princeton, NJ**
- *Award*: **Seventh Place** in Rhythm Chacha
- *Organizer*: Princeton University

June 2017 **Cricket All-Stars Mayor's Cup** **Albany, NY**
- *Award*: **Winner** of 2017 CDCA All-Stars Mayor's Cup
- *Organizer*: Capital District Cricket Association (CDCA)

Sep 2015 **137th New York State Chess Championship** **Albany, NY**
- *Award*: **Top Scoring Unrated Player** (Under 1200 Section)
- *Organizer*: United States Chess Federation (USCF)

Miscellaneous

Jan 2021 – Present **Independent Music Artist & Producer** **Worldwide**
- Writes and produces music.
- Links: YouTube, YouTube Music, Spotify, Apple Music, Amazon Music etc.

Jan 2021 – Present **Blog Writer** **Medium.com**
- Writes about life, philosophy, career, computer science, food and other interesting topics.
- Link: https://prasannadate.medium.com/

May 2017 – Dec 2017 **President, Cricket Club** **Rensselaer Polytechnic Institute, Troy, NY**
- Led the Cricket Club, comprising of 50 people at Rensselaer Polytechnic Institute.
- Scheduled practices, managed budget, procured equipment, organized club outing events and represented the club in RPI student union.

Jun 2013 – Aug 2013 **Summer Intern** **Larsen & Toubro Limited, Mumbai, India**
- Designed an automation system comprising of a robotic arm for TIG welding.
- Resulted in 15% improvement in productivity. Received a job offer based on that.

Aug 2012 – Dec 2012 **President, Department of Music** **BITS Pilani, India**
- Led the department of 50 people in conducting music workshops, organizing music performances and participating in music competitions.
- Generated revenue, managed finances, procured equipment and organized music events.

Jun 2012 – Aug 2012 **Summer Intern** **Thermax Limited, Pune, India**
- Created Standard Operating Procedures (SOP) for drum shop and panel shop, which were used in manufacturing bi-drum boilers.