

## **CURRICULUM VITAE**

**RAMANA KUMAR VINJAMURI**

Updated July 27, 2023

### **EDUCATION**

Ph.D.	2008	University of Pittsburgh, Pittsburgh, Electrical & Computer Engineering
M.S.	2004	Villanova University, Electrical Engineering
B.S.	2002	Kakatiya University, Electrical Engineering

### **Experience in Higher Education**

2023 – Present	University of Maryland, Baltimore County, Associate Professor, CSEE
2013 – Present	Indian Institute of Technology, Hyderabad, Visiting Professor, BME
2020 – 2023	University of Maryland, Baltimore County, Assistant Professor, CSEE
2013 – 2020	Stevens Institute of Technology, NJ, Assistant Professor, BME
2012 – 2013	Johns Hopkins University, Research Assistant Professor, BME
2012 – 2013	Johns Hopkins University, Whiting School of Engineering, Lecturer, BME
2008 – 2012	University of Pittsburgh, Pittsburgh, Post-doctoral Associate, PM&R
2004 – 2008	University of Pittsburgh, Pittsburgh, Graduate Research Assistant, ECE
2002 – 2004	Villanova University, Graduate Research Assistant, EE

### **Experience in Other than Higher Education**

2018 – Present	Beable Health Private Ltd, India, Visiting Researcher
2022 – Present	National Institutes of Health, Natnl. Inst. Drug Abuse (NIDA), Visiting Scientist

### **Honors Received**

2019	NSF CAREER Award
2019	Award of Research Excellence. Nominated. Stevens Institute of Technology, NJ
2018	Harvey N Davis Distinguished Teaching Award. Stevens Inst. of Tech., NJ
2018	Top 12 BCI Technologies in the world. BCI Award Foundation.
2013	Sheth Pitt Young Alumni Award. Finalist.
2011	Senior Member of Institute of Electrical & Electronics Engineers (IEEE)
2011	Mary E Switzer Merit Award, National Institute on Disability Independent Living Rehabilitation Research (NIDILRR)
2005	Graduate Research Fellowship, University of Pittsburgh
2004	Graduate Teaching Fellowship, University of Pittsburgh
2002	Graduate Research Fellowship, Villanova University

### **Research Support and/or Fellowships**

2022 – 2023	\$95,995, NSF Supplement for NSF CAREER Award, P.I.
2022 – 2023	\$100,000, NIDILRR, SBIR, Phase I, Co-P.I. (UMBC share: \$32,663)
2021 – 2022	\$25,000, UMBC START Grant, P.I.

2020 – 2023	\$15,000, National Science Foundation, IUCRC Planning Grant, P.I.
2019 – 2024	\$499,984, National Science Foundation, CAREER Award, P.I.
2019 – 2023	\$143, 573 (PI Share: \$57,646), US-India Sci. & Tech. Endow. Fund Grant, P.I.
2019 – 2020	\$50,000, New Jersey Health Foundation, P.I.
2018 – 2020	\$35,000, New Jersey Health Foundation, P.I.
2018 – 2020	\$30,000, Deans Lab Improvement Initiative, Stevens Inst. of Tech., PI
2016 – 2017	\$35,000, New Jersey Health Foundation, P.I.
2017 – 2018	\$15,000, Ignition Grants Initiative, Stevens Inst. of Tech, P.I.
2016 – 2017	\$15,000, Ignition Grants Initiative, Stevens Inst. of Tech, P.I.
2014 – 2020	\$23,500, Center for Healthcare Innovation, Stevens Inst. of Tech, P.I.
2010 – 2011	\$65,000, Mary E Switzer Merit Fellowship, NIDILRR, P.I.

Pending/ Under review

2022 –	\$500,000, NIDILRR, DRRP, P.I. (Received feedback, Resubmit in Apr 2023)
2022 –	\$165,000, TEDCO MII, P.I. (Received feedback, Resubmission in Nov 2022)
2021 –	\$1,200,000, NSF, P.I. (Received feedback, Resubmission in Dec 2022)
2021 –	\$1,200,000, NSF, co-P.I. (Received feedback, Resubmission in Nov 2022)

### **Ph.D. Students**

Dingyi Pei, in progress, Advisor (Completed Proposal Defense and Candidacy in Spring 2022), UMBC  
 Parthan Olikkal, in progress, Advisor (Completed Proposal Defense in Spring 2023), UMBC  
 Farshad Sahavi, in progress, Advisor (Portfolio planned in Spring 2023), UMBC  
 Sadia Sheikh, in progress, Advisor (Portfolio planned in Fall 2023), UMBC  
 Mohd. Toufiq Hasan Anik, in progress, Member, UMBC  
 Rui Jin, in progress, Member, UMBC  
 Rami Mowakeaa, 2022, Member, UMBC  
 Yao Yao, 2022, Member, UMBC  
 Deepa Gupta, 2022, Member, UMBC  
 Martin Burns, 2020, Advisor, Stevens Institute of Technology  
 Vrajeshri Patel, 2018, Advisor, Stevens Institute of Technology  
 Hanyan Li, 2019, Member, Stevens Institute of Technology  
 Wenbo Liu, 2019, Member, Stevens Institute of Technology  
 Mohammad Alnakhli, 2018, Member, Stevens Institute of Technology  
 Wonyoung Kim, 2017, Member, Stevens Institute of Technology

At Stevens Institute of Technology (2013 - 2020), PhD students from Vinjamuri Lab have won 11 awards including IEEE NSF Award for Young Professionals, 1<sup>st</sup> and 2<sup>nd</sup> places in International Society of Pharmaceutical Engineering Annual Meeting and Johnson and Johnson Engineering Showcase. The two PhD students who have graduated from Vinjamuri Lab have received awards for Outstanding Research by a PhD student in Biomedical Engineering.

### **Master's Students**

Parthan Olikkal, 2021, Advisor, UMBC  
 Aniket Shah, 2019, Member, Stevens Institute of Technology  
 Kevin Walsh, 2019, Member and Reader, Stevens Institute of Technology  
 Hafsa Nadia, 2018, Advisor, Stevens Institute of Technology  
 David Hollinger, 2018, Member and Reader, Stevens Institute of Technology

**Undergraduate Students**

Xavier Smith (Meyerhoff Scholar), 2022, Mentor, UMBC  
Matthew Makila (Meyerhoff Scholar), 2022, Mentor, UMBC  
Xavier Smith (U-RISE Scholar), 2022, Mentor, UMBC  
Erick Kengni (Meyerhoff Scholar), 2022, Mentor, UMBC  
Laura McAllister (CWIT Scholar), 2021, Mentor, UMBC  
Emily King (CWIT Scholar), 2021, Mentor, UMBC  
Jimmy Coleman (Meyerhoff Scholar), 2021, Mentor, UMBC

At Stevens Institute of Technology (2013 - 2020), undergraduate students (listed below) in Vinjamuri Lab have won 9 Center for Healthcare Innovation Scholarships, 5 Innovation and Entrepreneurship Summer Scholarships, 6 Independent College Fund of New Jersey Program, and 1 PSEG program for advancing Science, Technology and Engineering.

Michael Obando, Stevens Pinnacle Research Scholar, 2019; Zamin Akmal, Summer Research Volunteer, 2019; Skylar Migliaccio, CHI Research Scholar, 2019-2020; Skylar Migliaccio, Stevens Pinnacle Research Scholar, 2019. Magdalena Slonski, Stevens Pinnacle Research Scholar, 2018; Michael Obando, ICFNJ Research Fellow, 2018-2020; Brandon Herb, I&E Summer Research Fellow, 2018; Shreya Anjaria, CHI Research Fellow, 2018-2019; Hirra Shirani, ICFNJ Research Fellow, 2018-2019; Daniel Cleary, Summer Research Scholar, 2018; Katie Van Orden, Pinnacle Research Scholar, 2016-; Rachel Rosa, Stevens Scholar, CHI Research Fellow, 2016-; Sal Finocchiaro, ICFNJ Research Fellow, 2017-2018; Jacob Coumans, ICFNJ Research Fellow, 2017-2018; Jay Patel, ICFNJ Research Fellow, 2017-2018; Stephanie Sayegh, ICFNJ Research Fellow, Summer 2016-2017; Christian Jensen, Pinnacle Research Scholar, Summer 2017; Gerald Lamina, I&E Research, 2016; Katie Van Orden, Pinnacle Scholar Research, 2016; Jeffrey Paine, Stevens Scholar Research, Summer 2016; Rachel Rosa, Stevens Scholar Research, 2016; Michelle Schumacher, Stevens Scholar Research, Summer 2016; Julia Stika, Summer Research Student, Summer 2016; Richard Schermerhorn, Pinnacle Scholar Research, 2016; Zach Zavoda, I&E Research, 2016; Jamie Craig, Scholars and CHI Research, 2015-2016; Poojita Thukral, BITS Goa, India, Senior Design 2015; Sara Hassan, CHI Research, 2014-15; Akash Sharma, ChemBio Senior Design 2014; Kevin Doherty, ECE, Summer Research 2014; Faisal Mansuri, BME, Summer Research 2014; Piotr Kulik, ECE, Summer Research 2014; Tim Dana, BME, Summer Research 2014; Mike Magglio, BME, Summer Research 2014; Martin Burns, BME, I&E Summer Research 2014.

Undergraduate student researchers teaming up with graduate students in my lab have published journal papers, conference papers and book chapters and even patent applications as indicated in the following section

**High School Students**

Ian Jackson, 2021, Mentor, UMBC  
Krishna Kasi, 2022, Mentor, UMBC  
Varsha Penumalee, 2022, Mentor, UMBC  
Smrdhi Mahajan, 2022, Mentor, UMBC  
Niyati Sharma, 2022, Mentor, UMBC  
Helen Myerson, 2018, Mentor, Stevens Institute of Technology  
Rohan Mukundan, 2016 - 2018, Mentor, Stevens Institute of Technology  
Shweta Vazhappily, 2015, Mentor, Stevens Institute of Technology  
Srushi Karra, 2014, Mentor, Stevens Institute of Technology

High school student researchers teaming up with graduate and undergraduate students in my lab have published journal papers, conference papers and book chapters as indicated in the following section.

## PUBLICATIONS, PRESENTATIONS, AND CREATIVE ACHIEVEMENTS

Note: In my field of research, journal articles are considered as important publications, then edited books, conference papers, and book chapters, respectively, in that order. It is a standard practice in the journals and conferences I have submitted that the senior author and corresponding author is the last author. The student is the first author. Undergraduate student researchers are indicated with a ‡ symbol and high school student researchers are indicated with a # symbol.

Metrics: h-index: 17; i10-index: 26; Total Citations: 1471. All citations are based on Google Scholar as of May 02, 2023. The most recent Google Scholar Profile can be found here:

[https://scholar.google.com/citations?hl=en&user=Ok92zD4AAAAJ&view\\_op=list\\_works&sortby=pubdate](https://scholar.google.com/citations?hl=en&user=Ok92zD4AAAAJ&view_op=list_works&sortby=pubdate)

- **Peer-Reviewed Works**

- **Journal Articles**

1. K. Jambhale, S. Mahajan, B. Rieland, N. Banerjee, A. Dutt, S.P. Kadiyala, and R. Vinjamuri, “Identifying biomarkers for accurate detection of stress”, *Sensors*. 2022. (Impact Factor: 3.576)
2. P. Olikkal, D. Pei, T. Adali, N. Banerjee, and R. Vinjamuri, “Data fusion-based musculoskeletal synergies in the grasping hand”, *Sensors*. 2022. (Impact Factor: 3.576)
3. D. Pei, P. Olikkal, T. Adali, and R. Vinjamuri, “Reconstructing synergy-based hand grasp kinematics from electroencephalographic signals”, *Sensors*. 2022. (Impact Factor: 3.576)
4. D. Pei, P. Olikkal, T. Adali, and R. Vinjamuri, “Dynamical synergies in multidigit hand prehension”, *Sensors*. 2022. (Impact Factor: 3.576)

*---Prior to joining UMBC---*

5. M. Burns, D. Pei, R. Vinjamuri. “Myoelectric control of a soft hand exoskeleton using kinematic synergies,” *IEEE Transactions on Biomedical Circuits and Systems*. 2019. (Impact Factor: 4.29).
6. M. Burns, D. Pei, R. Vinjamuri. “Dynamic control of virtual hand grasp using spatiotemporal synergies,” *IEEE Access*. 2019. (Impact Factor: 3.367).
7. D. Pei, V. Patel, M. Burns, R. Chandramouli, R. Vinjamuri. “Neural decoding of synergy-based hand movements using electroencephalography,” *IEEE Access*. 2019. (Impact Factor: 3.367).
8. D. Pei, M. Burns, R. Chandramouli, R. Vinjamuri. “Decoding asynchronous reaching in electroencephalography using stacked autoencoders,” *IEEE Access*. 2018: 52889-52898. (Impact Factor: 3.367).
9. V. Patel, M. Burns, R. Chandramouli, R. Vinjamuri. Biometrics based on hand synergies and their neural representations. *IEEE Access*. Vol.5. 13422-13429. 2017. (Impact Factor: 3.367).
10. V. Patel, M. Burns, P. Thukral, I. Florescu, R. Chandramouli, R. Vinjamuri. Hand grasping synergies as biometrics. *Frontiers in Bioengineering and Biotechnology*. Vol.5. 2017. (Impact Factor: 5.89).
11. V. Patel, J. Craig, M. Schumacher<sup>‡</sup>, M. Burns, I. Florescu and R. Vinjamuri. Synergy repetition training versus task repetition training in acquiring new skill. *Frontiers in Bioengineering and Biotechnology*. Vol.5. 2017. (Impact Factor: 5.89).
12. M. Burns, V. Patel, I. Florescu, K. Pochiraju, R. Vinjamuri. Low dimensional synergistic representation of bilateral reaching movements. *Frontiers in Bioengineering and Biotechnology*. Vol.5. 2017. (Impact Factor: 5.89).
13. V. Patel, M. Burns, R. Vinjamuri. Effect of visual and tactile feedback on kinematic synergies in grasping hand. *Medical and Biological Engineering and Computing*, 2015. (Impact Factor: 2.602).

14. V. Patel, M. Burns, Z.H. Mao, N. Crone, R. Vinjamuri. Linear and nonlinear synergies in grasping hand. *Journal of Bioengineering & Biomedical Science*, 2015. (Impact Factor: 1.0 CiteScore: NA).
15. R. Vinjamuri, V. Patel, M. Powell, N. Crone. Candidates for synergies: principal components vs. linear discriminants. *Computational Intelligence and Neuroscience*, Vol. 2014, 2014. (Impact Factor: 3.633).
16. J. Collinger, R. Vinjamuri, A. Degenhart, D. Weber, G. Sudre, M. Boninger, E. Tyler-Kabara, and W. Wang. "Motor-related brain activity during action observation: a neural substrate for electrocorticographic brain-computer interfaces after spinal cord injury." *Frontiers in Integrative Neuroscience*. Vol. 8, 2014. (Impact Factor: 4.677).
17. W. Wang, J. L. Collinger, A. D. Degenhart, E. C. Tyler-Kabara, A. B. Schwartz, D. W. Moran, B. Wodlinger, R. Vinjamuri, J. Kelly, R. Ashmore, M. Boninger. An Electrocorticographic Brain Interface in an Individual with Tetraplegia. *PLOS ONE*, 8(2):e55344, 2013. (Impact Factor: 3.24).
18. R. Vinjamuri, D. Weber, Z.-H. Mao, J. Collinger, A. Degenhart, J. Kelly, M. L. Boninger, E. C. Tyler-Kabara and W. Wang. Towards synergy-based control in brain machine interfaces. *IEEE Transactions in Information Technology and Biomedicine*, Vol.15, pp.726-736, 2011. (Impact Factor: 3.850).
19. R. Vinjamuri, M. Sun, R. Scabassi, and Z.-H. Mao. Dimensionality reduction in control and coordination of human hand. *IEEE Transactions on Biomedical Engineering*, Vol.57, pp. 284-295, 2010. (Impact Factor: 4.538).
20. R. Vinjamuri, M. Sun, R. Scabassi, and Z. -H. Mao. Temporal postural synergies of hand in rapid grasping tasks. *IEEE Transactions on Information Technology in Biomedicine*, Vol.14, pp. 986-994, 2010. (Impact Factor: 3.850).
21. R. Vinjamuri, D. Crammond, D. Kondziolka, H.-N. Lee and Z.-H. Mao. Extraction of sources of tremor in hand movements of patients with movement disorders. *IEEE Transactions on Information Technology in Biomedicine*, Vol.13, pp. 49-56, 2009. (Impact Factor: 3.850).
22. P. Singh, R. Vinjamuri, X. Wang, and D. Reisner. Design and implementation of a fuzzy logic-based state-of-charge meter for Li-ion batteries used in portable defibrillators. *Journal of Power Sources* 162 (2), 829-836, 2006. (Impact Factor: 9.127).

○ **Conference Proceedings**

23. H. Mao, J. Widjaja, Y. Guo, J. Yin, and R. Vinjamuri, "Finding robust low dimensional features for sleep detection using EEG Data", 2nd International Conference on Data Science and Computer Application (ICDSCA), Dalian, China, 2022.
24. K. Jambhale, B. Rieland<sup>‡</sup>, S. Mahajan<sup>#</sup>, P. Narsay, N. Banerjee, A. Dutt, and R. Vinjamuri, "Selection of optimal physiological features for accurate detection of stress", 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Glasgow, Scotland, UK, 2022.
25. P. Olikkal, D. Pei, T. Adali, N. Banerjee, and R. Vinjamuri, "Musculoskeletal synergies in grasping hand", 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Glasgow, Scotland, UK, 2022.
26. D. Pei, P. Olikkal, T. Adali, and R. Vinjamuri, "Dynamical synergies in multidigit hand prehension", 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Glasgow, Scotland, UK, 2022.
27. M. Burns, R. Rosa<sup>†</sup>, Z. Akmal<sup>†</sup>, J. Conway, D. Pei, E. King<sup>‡</sup>, N. Banerjee, and R. Vinjamuri, "Design and implementation of an instrumented data glove that measures kinematics and dynamics of human hand", in 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Guadalajara, Mexico, 2021.
28. D. Pei, T. Adali, and R. Vinjamuri, "Generalizability of hand kinematic synergies derived using independent component analysis", in 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Guadalajara, Mexico, 2021.

29. M. Burns, Z. Zavoda, R. Nataraj, K. Pochiraju, and R. Vinjamuri, "HERCULES: A three degree-of-freedom pneumatic upper limb exoskeleton for stroke rehabilitation", in 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Montreal, Canada, 2020.
30. M. Burns, J. Stika<sup>†</sup>, V. Patel, D. Pei, R. Nataraj and R. Vinjamuri, "Lateralization and Model Transference in a Bilateral Cursor Task", in 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Montreal, Canada, 2020.

*---Prior to joining UMBC---*

31. V. Patel, M. Burns, D. Pei, and R. Vinjamuri, "Decoding Synergy-Based Hand Movements Using Electroencephalography," in 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Hawaii, USA, 2018.
32. V. Patel, M. Burns, I. Florescu, R. Chandramouli, and R. Vinjamuri. A novel biometric based on neural representations of synergistic hand grasps. IEEE Future Technologies Conference. Vancouver. Canada. 2017.
33. M. Burns, K. Van Orden<sup>†</sup>, V. Patel, R. Vinjamuri. Towards a wearable hand exoskeleton with embedded synergies. 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Jeju Island, Korea, 2017.
34. V. Patel, M. Burns, M. Pourfar, A. Mogilner, D. Kondziolka, R. Vinjamuri. QAPD: An Integrated System to Quantify Symptoms of Parkinson's Disease. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, FL, USA, 2016.
35. M. Fifer, G. Milsap<sup>†</sup>, E. Greenwald, D. McMullen, W. S. Anderson, N. V. Thakor, N. E. Crone, R. Vinjamuri. Design and Implementation of a Human ECoG Simulator for Testing Brain-Machine Interfaces. IEEE NER, San Diego, CA, 2013.
36. A. Degenhart, J. Collinger, R. Vinjamuri, J. Kelly, E. Tyler-Kabara, W. Wang. Classification of hand posture from electrocorticographic signals recorded during varying force conditions, in Proceedings of the 33rd IEEE EMBS Annual International Conference, Boston, MA, USA, 2011.
37. S. Foldes, R. Vinjamuri, W. Wang, D. Weber, J. Collinger. Stability of MEG for real-time neurofeedback, in Proceedings of the 33rd IEEE EMBS Annual International Conference, Boston, MA, USA, 2011.
38. R. Vinjamuri, A. Degenhart, J. L. Collinger, D. J. Crammond, E. Tyler-Kabara, D. J. Weber, M. Boninger, Z.-H. Mao, W. Wang. Towards synergy-based brain machine interfaces. Neuroscience, San Diego, CA, Nov. 17-21, 2010.
39. R. Vinjamuri, A. Degenhart, J. L. Collinger, G. P. Sudre, D. J. Crammond, E. Tyler-Kabara, D. J. Weber, W. Wang. Decoding hand posture based on human micro-electrocorticographic signals recorded during action observation. Neuroscience, Chicago, IL, Oct. 17-21, 2009.
40. R. Vinjamuri, A. Degenhart, J. L. Collinger, G. P. Sudre, E. Leuthardt, D. Moran, M. Boninger, A. B. Schwartz, D. J. Crammond, E. Tyler-Kabara, D. J. Weber, W. Wang. Human micro-electrocorticographic signals recorded during action execution and observation. BMES Annual Fall Scientific Meeting, Pittsburgh, PA, Oct. 7-10, 2009.
41. W. Wang, A. Degenhart, J. Collinger, R. Vinjamuri, G. Sudre, P. Adelson, D. Holder, E. Leuthardt, D. Moran, M. Boninger, A. Schwartz, D. Crammond, E. Tyler-Kabara and D. Weber. Human motor cortical activity recorded with micro-ECoG electrodes during individual finger movements, in Proceedings of the 31st IEEE EMBS Annual International Conference, Minneapolis, MN, USA, 2009.
42. J. Collinger, W. Wang, A. Degenhart, R. Vinjamuri, G. Sudre, E. Tyler-Kabara, D. Weber Towards a direct brain interface for controlling assistive devices, in International Symposium on Quality-of-Life Technologies, Pittsburgh, PA, 2009.
43. R. Vinjamuri, M. Sun, and Z.-H. Mao. A framework for extracting kinematic synergies of hand movement, in NSF Engineering Research and Innovation Conference, Hawaii, 2009.

44. R. Vinjamuri, D. Weber, A. Degenhart, J. Collinger, G. Sudre, P. D. Adelson, D. L. Holder, M. L. Boninger, A. B. Schwartz, D. J. Crammond, E. C. Tyler-Kabara and W. Wang. A Fuzzy logic model for hand posture control using human cortical activity recorded by micro-ECoG electrodes, in Proceedings of the 31st IEEE EMBS Annual International Conference, Minneapolis, MN, USA, 2009.
45. R. Vinjamuri, M. Sun, D. Weber, W. Wang, D. Crammond, and Z.-H. Mao. Quantizing and characterizing the variance of hand postures in a novel transformation task, in Proceedings of the 31st IEEE EMBS Annual International Conference, Minneapolis, MN, USA, 2009.
46. R. Vinjamuri, M. Sun, R. Scabassi, and Z.-H. Mao. Inherent bimanual postural synergies in hands, in Proceedings of the 30th IEEE EMBS Annual International Conference, Canada, pp. 5093-5096, 2008.
47. R. Vinjamuri, M. Sun, R. Scabassi, and Z. -H. Mao. Temporal variation of postural synergies of the human hand during grasping. 16th international conference on mechanics in medicine and biology, Pittsburgh, PA, USA, 23rd-25th July 2008.
48. R. Vinjamuri, D. Crammond, D. Kondziolka, and Z.-H. Mao. Extraction of neural sources from kinematic profiles of hand movement, in NSF Engineering Research and Innovation Conference, Knoxville, TN, 2008.
49. R. Vinjamuri, Brian Dicks, Mingui Sun, Robert Scabassi, and Z.-H. Mao. Graphical realization of time-varying synergies in velocity profiles of finger joints of the hand during reach and grasp, in NSF Engineering Research and Innovation Conference, Knoxville, TN, 2008.
50. R. Vinjamuri, M. Sun, R. Scabassi, and Z. -H. Mao. Temporal variation of postural synergies of the human hand during grasping. 16th international conference on mechanics in medicine and biology, Pittsburgh, PA, USA, 23rd-25th July 2008.
51. R. Vinjamuri, Z.-H. Mao, R. Scabassi, and M. Sun. Time-varying synergies in velocity profiles of finger joints of the hand during reach and grasp, in Proceedings of the 29th IEEE EMBS Annual International Conference, France, pp. 4846-4849, 2007.
52. R. Vinjamuri, Z.-H. Mao, R. Scabassi, and M. Sun. A novel architecture for the design of prosthetic and robotic hands, in 32nd Northeast Bio Engineering Conference, Allentown, PA, pp. 163-164, 2006.
53. R. Vinjamuri, Z.-H. Mao, R. Scabassi, and M. Sun. Limitations of surface EMG signals of extrinsic muscles in predicting postures of human hand, in Proceedings of the 28th IEEE EMBS Annual International Conference, NY, USA, pp. 5491-5494, 2006.
54. P. Singh, R. Vinjamuri, X. Wang, and D. Reisner. Fuzzy logic based state-of-health estimation of Li-ion Batteries, in 41st Power Sources Conference, Philadelphia, PA, pp. 461-464, 2004.
55. P. Singh, R. Vinjamuri, X. Wang, and D. Reisner. Fuzzy logic modeling of EIS measurements on Lithium-ion batteries, in International Symposium on Electro chemical Impedance Spectroscopy, Cocoa Beach, FL, 2004.

• **Books**

56. R. Vinjamuri (Ed.) Human-Robot Interaction: Perspectives and Applications. InTech. Croatia. 2023.
57. J. H. Ortiz and R. Vinjamuri (Eds). Collaborative and Humanoid Robots. InTech, Croatia. 2021.

*---Prior to joining UMBC---*

58. R. Vinjamuri (Ed.) Advances in Neural Signal Processing. London, United Kingdom, IntechOpen, 2020 [Online]. Available from: <https://www.intechopen.com/books/8851> doi: 10.5772/intechopen.81424
59. R. Vinjamuri (Ed.), Advances in Motor Neuroprostheses. Springer Nature, NY, 2020.
60. R. Vinjamuri (Ed.) Prosthesis. London, United Kingdom, IntechOpen, 2020 [Online]. Available from: <https://www.intechopen.com/books/7178> doi: 10.5772/intechopen.73978
61. R. Vinjamuri, Z. H. Mao, and A. Maybhate (Eds.), Applications of Synergies in Human Machine Interfaces. Lausanne: Frontiers Media. doi: 10.3389/978-2-88945-897-4.

62. R. Vinjamuri (Ed.) Biomimetic Prosthetics. London, United Kingdom, IntechOpen, 2018 [Online]. Available from: <https://www.intechopen.com/books/5943> doi: 10.5772/66062

- **Book Chapters**

63. H. Meyerson<sup>#</sup>, P. Olikkal, D. Pei, and R Vinjamuri, “Introductory Chapter: Human-Robot Interaction–Advances and Applications” in Human-Robot Interaction: Perspectives and Applications. InTech. Croatia. 2023.
64. D. Pei, and R. Vinjamuri, “Introductory Chapter: Methods and Applications of Neural Signal Processing,” in Advances in Neural Signal Processing, R. Vinjamuri, Ed. Intech, 2020.
65. D. Pei, M. Burns, V. Patel, and R. Vinjamuri, “Neural Decoding of upper limb movements using electroencephalography,” in Brain-Computer Interface Research: A State-of-the-Art Summary, C. Guger, Ed. Springer, 2020.
66. M. Burns, R. Vinjamuri, “Design of a soft glove-based robotic hand exoskeleton with embedded synergies,” in Advances in Neuromotor Prostheses, R. Vinjamuri, Ed. Springer, 2020.
67. M. Burns, S. Madanagopalan, R. Mukundan<sup>#</sup>, H. Myerson<sup>#</sup>, and R. Vinjamuri, “Introductory Chapter: State of the art prosthesis,” in Prosthesis, R. Vinjamuri, Ed. Intech, 2020.
68. M. Burns, M. Schumacher<sup>†</sup>, and R. Vinjamuri, “Introductory Chapter: Toward Near-Natural Assistive Devices,” in Biomimetic Prosthetics, R. Vinjamuri, Ed. Intech, 2018.
69. R. Vinjamuri, W. Wang, M. Sun and Z.-H. Mao (2012). Application of linear and nonlinear dimensionality reduction methods, Principal component analysis, Parinya Sanguansat (Ed.), ISBN: 978-953-51-0195-6, InTech.

- **Works Submitted or In Preparation**

- **Articles**

70. P. Olikkal, D. Pei, T. Adali, N. Banerjee, and R. Vinjamuri, “Data fusion-based muscle synergies in the grasping hand”

- **Conference Proceedings**

71. V. Penumalee<sup>#</sup> and R. Vinjamuri, “Development of a mobile app for objective assessment of prosthesis rejection rates in end-users”, RESNA 2022. Accepted.

- **Books**

72. R. Vinjamuri (Ed.) Human-Robot Interaction – Perspectives and Applications. London, United Kingdom, IntechOpen, 2022

- **Patents**

1. R. Vinjamuri (Lead), N. Banerjee, A. Dutt. An integrated system for real-time detection and management of substance use disorder. (US Provisional Patent Application No. 63/214,417). 2021.

*---Prior to joining UMBC---*



2. R. Vinjamuri (Lead), M. Burns, R. Rosa<sup>†</sup>. 3D-printed custom-fit instrumented glove with embedded sensors (US Provisional Patent Application No. 101995-049100). 2019.
3. R. Vinjamuri (Lead), M. Burns, V. Patel. Hand exoskeleton with embedded biomimetic control mechanisms (US Nonprovisional Patent Application No. 101995-046401). 2018.
4. R. Vinjamuri (Lead), V. Patel, R. Chandramouli. Cybersecurity authentication with hand synergies (US Provisional Patent Application No. 62/352,132). 2016.
5. R. Vinjamuri (Lead), W. Wang, Z.-H. Mao, D. Weber. Human machine interface based on task-specific temporal postural synergies (US Patent No. 13/246,190). 2015.

• **Invited Talks and Professional Presentations**

1. Technology Transfer in Health Sector in India vis-à-vis foreign countries. Panelist. School of Engineering, Tezpur University, Assam, India. Jan 2023.
2. Technology Transfer in Healthcare in the US. Symposium on Technology Transfer in Health Sector. Tezpur University, Assam, India. Jan 2023.
3. Technology Rollout from Academia. Certificate Program on Intellectual Property Rights for Enterprise Development. Tezpur University, Assam, India. Jan 2023.
4. BCI for upper-limb prostheses control. BCI & Neurotech Masterclass US Capital Region 1.0. Oct 2022.
5. On the roles of synergy-based human machine interfaces in human robot interaction. Workshop on Neurodesign in HRI. IEEE SMC. Oct 2022.
6. Brain machine interfaces for upper limb motor control. Faculty Development Program, E&ICT, NIT Warangal, India. Sep 2022.
7. Prosthetics and neuroprosthetics. Summer Bridge Talk, UMBC. July 2022.
8. Synergy-based human-machine interfaces. Nalla Narasimha Reddy Group of Institutions, Hyderabad, India. June 23, 2022.
9. Synergy-based human machine interfaces. Workshop on Healthcare Robotics and Drone Applications. Indian Institute of Technology Mandi, India. May 27-29, 2022.
10. Synergy-based human machine interfaces. University of Delaware. ECE Department Seminar Series. May 2022.
11. Brain-Machine Interfaces. Tau Beta Pi (Engineering Honors Society). UMBC. April. 2022
12. Prosthetics and Neuroprosthetics. National Institute of Technology. Warangal. India. November 2021.
13. Synergy-based human-machine interfaces. Department of Electrical and Computer Engineering Seminar Series. Cosponsored by IEEE Student Chapter. SRM Andhra. Andhra Pradesh. India. May 2021.
14. Prosthetics and Neuroprosthetics. International Workshop on Recent Trends in Biomedical Instrumentation and Assistive Technology. National Institute of Technology. Tiruchirappalli. India. May 2021.
15. Biomimetic Algorithms for Prosthetics and Neuroprosthetics. Army Futures Command. US Army Research Laboratory. May 2021.
16. Synergy-based human-machine interfaces. ISC Seminar Series. Johns Hopkins University Applied Physics Laboratory. April 2021.
17. Synergy-based human-machine interfaces. Beyond the Books. A scientific talk series. D. Y. Patil University, Pune, India. April 2021.
18. Humanoid Robots. Implications and Realities of Industry 4.0 (IRI4.0), Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, India. December 2020.
19. Sensorimotor control. ACM Student Chapter & IEEE Welcome Event. UMBC. October 2020.
20. Synergy-based human-machine interfaces. Institute of Engineers (TLC), Tiruchirappalli, India. July 2020.

*---Prior to joining UMBC---*

21. Synergy-based human-machine interfaces. University of Maryland Baltimore County. Department of Computer Science and Electrical Engineering Seminar Series. March 2020.
22. Synergy-based human-machine interfaces. New Jersey Institute of Technology. Department of Biomedical Engineering Seminar Series. Feb 2020.
23. Can biomimetic control algorithms enable near natural prosthetics? Theme: Emerging Advancement in the field of Biomedical Research. International Conference on Biomedical and Clinical Research. Philadelphia, PA. June 2019.
24. NSF “BRAIN” Roadmap Conference. Invited as Focus Group Lead for Soft Robotics and Noninvasive Brain Machine Interfaces. Cancun. Mexico. May 2019.
25. Presentation proposal to establish NSF sponsored IUCRC “BRAIN” Center, NSF Industry Advisory Board, University of Houston, Houston, 2018.
26. Decoding synergy-based hand movements using EEG. 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2018.
27. Spotlight. Talk and Interview on Neural Behavioral Biometrics. IEEE Future Technologies Conference, Vancouver, Canada. 2017.
28. Towards a wearable hand exoskeleton with embedded synergies. 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Jeju Island, Korea, 2017.
29. Applications of Electroencephalography in Neuroprosthetics. Department of Neurology. Care Hospitals, Hyderabad, India. June 2015.
30. Advances in Biomedical Instrumentation – Prosthetics. Department of Biomedical Engineering. Indian Institute of Technology, Hyderabad, India. June 2015.
31. Synergy-based Brain Machine Interfaces. NYMedTalks Conference. New York Medical College, Valhalla, NY. USA. Nov. 2014.
32. Advances in Brain Machine Interfaces. Department of Biomedical Engineering. Indian Institute of Technology, Hyderabad, India. June 2014.
33. A synergy-based brain-machine interface for dexterous control of Prosthetic Hands. Biomedical Engineering Wallace H. Coulter Foundation Seminar Series. Florida International University, Miami, USA, Feb. 2011.

## **SERVICE TO THE DEPARTMENT, UNIVERSITY, COMMUNITY AND PROFESSION**

### **Service to the Department**

2022 – Present	Member, CS Faculty Search Committee
2022 – Present	Member, EE Faculty Search Committee
2021 – 2022	Member, Committee on introducing a new “Bio-focused” track within CMSC/CMPE/ENEE
2020 – Present	Member, CS Graduate Program Committee.
2020 – Present	Member, CS Graduate Admissions Committee.
2020 – Present	Interviewer for Faculty Candidates, CSEE Department.
2019 – 2020	Member, Graduate Curriculum Committee, Biomedical Engg., Stevens Inst. of Technology
2019 – 2020	Member, Graduate Student Awards Committee, Biomedical Engg., Stevens Inst. of Technology
2019 – 2020	Member, Department Chair Search Committee, Biomedical Engg., Stevens Inst. of Technology

### **Service to University**

2022 – Present	Department Ambassador, Maryland Charity Campaign
2022	Speaker, UMBC CNMS and COEIT NSF CAREER Workshop
2022	Interviewer for University wide Human Health Faculty Candidates Search.

2021	Speaker, UMBC CNMS and COEIT NSF CAREER Workshop
2021	Panelist, Socially Responsible Research Panel (Moderator: Erin Lavik).
2018 – 2020	Member, Institutional Review Board, Stevens Institute of Technology
2018 – 2020	Member, Committee on Committees, Stevens Institute of Technology
2019 – 2020	Member, Research Enterprise and Technology Commercialization, Stevens Inst. of Technology
2019 – 2020	Member, Master's Program Task Force, Stevens Institute of Technology

### Service to the Profession

#### Journal Editorial Boards, Guest Editing and Conferences

2019 – Present	Associate Editor, <i>nature</i> Scientific Data
2019 – Present	Associate Editor, IEEE ACCESS
2018	Session Chair, Neural Signal Processing, IEEE EMBC
2018	Special Topics Editor, Frontiers in Bioengineering and Biotechnology
2017 – Present	Associate Editor, Frontiers in Bioengineering and Biotechnology
2017	Special Topics Editor, Frontiers in Bioengineering and Biotechnology
2023	Special Topics Editor, Frontiers in Robotics and AI
2017	Session Chair, Motor Neuroprosthesis, IEEE EMBC
2013 – Present	Associate Editor, Medical and Biological Engineering and Computing, Springer
2013 – Present	Reviewer for IEEE Access, IEEE Transactions in Biomedical Engineering, Journal of Neural Engineering, IEEE Transactions on Neural Networks, IEEE Transactions on Intelligent Transport Systems, IEEE EMBC, IEEE EMBS BHI, Sensors, International Journal of Radio Frequency Identification Technology and Applications, International Journal of Nano Medicine, Journal of Mechanics in Medicine and Biology, Journal of Medical & Biological Engineering & Computing, Frontiers in Systems Neuroscience, and Brain Structure and Function.

#### Panels and Study Sections

- Panelist for National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR) for—(i) Field Initiated Projects (ii) Mary E. Switzer Merit Fellowships, (iii) SBIR Phases I and II and (iv) Advanced Rehabilitation Research and Training.
- Panelist for Department of Defense (DoD), Congressionally Directed Medical Research Programs (CDMRP) for (i) Neuroprosthetics (NP) (ii) Neurostimulation Technologies (NST) peer review panel of the Spinal Cord Injury Research Program (SCIRP) (iii) Military Operational Medicine (MOM) peer review panel of the Joint Warfighter Medical Research Program (JWMP) and (iv) Medical Simulation and Information Sciences (MSIS) (v) Orthotics and Prosthetics Outcomes Research Program (OPORP).
- Panelist for NSF Future of Work at the Human Technology Frontier (FW-HTF).
- Panelist for NSF Computer and Information Science and Engineering (CISE) Cyber Human Systems (CHS) CAREER
- Panelist for NSF Emerging Frontiers in Research Innovation (EFRI) Brain-inspired Dynamics for Engineering Energy-Efficient Circuits and Artificial Intelligence (BRAID).

- Panelist for The Netherlands Organization for Health Research and Development (ZonMw) program for Translational Research.

### Other Services

2010 – 2012 Chapter Chair for IEEE Signal Processing Society, Pittsburgh Chapter  
 2017 Panel Judge, Artificial Intelligence – Human Machine Interfaces, 25th Annual Beacon Conference, Bergen Community College, Paramus, NJ.

### Workshops

2022 NSF IUCRC BRAIN Center Planning Meeting Workshop. Organized by Ramana Vinjamuri. Co-organized by Tulay Adali, Nilanjan Banerjee, Fowsen Choa, Don Engel, and Seung-Jun Kim. Sep 9, 2022. UMBC.

2022 3<sup>rd</sup> Brain Computer Interface Workshop. Organized by Ramana Vinjamuri and Christoph Guger. Scheduled. UMBC

2022 1<sup>st</sup> Wearables for Health and Wellbeing Workshop. Organized by Ramana Vinjamuri and Delsys. Scheduled. UMBC.

2019 2<sup>nd</sup> Brain Computer Interface Workshop. Organized by Ramana Vinjamuri and mBrainTrain. Oct. 28, 2019. Graduate students from Vinjamuri lab coordinated logistics. Stevens Institute of Technology.

2018 1<sup>st</sup> Brain Computer Interface Workshop for Control, Assessment and Rehabilitation at Stevens Institute of Technology. Organized by Ramana Vinjamuri and Christoph Guger. Oct. 30, 2018. Graduate students from Vinjamuri lab coordinated logistics. Stevens Institute of Technology.

## **TEACHING**

### **Teaching at UMBC**

Teaching at UMBC has been a challenging but fulfilling experience for me. It was challenging because of the remote and hybrid teaching environment yet fulfilling as students embraced my teaching and reciprocated enthusiastically. I have taught at undergraduate and graduate levels. The integration of the didactic component of the lectures with practical research experience resonates well with students and is reflected in their very positive evaluations of the courses. Despite the pandemic, students have reassured and rewarded my efforts with an overall rating of 4.96/5.

Fall 2020	Computer Architecture (Undergrad Core), Overall evaluation 4.94/5
Spring 2021	Intro. to Brain Computer Interfaces (Grad/Undergrad Special Topics), Overall evaluation, 4.96/5
Fall 2021	Computer Architecture (Undergraduate Core), Overall evaluation 4.96/5
Spring 2022	Intro. to Brain Computer Interfaces (Grad/Undergrad Special Topics), Overall evaluation, 5/5
Fall 2022	Computer Architecture (Undergraduate Core), Overall evaluation 4.9/5

### **Teaching at Stevens Institute of Technology**

Teaching at Stevens has been a rewarding and fulfilling experience for me. I have been recognized by the Provost and Vice-Provost for teaching excellence when students rated me highly in their evaluations. Over the course of my teaching years, I have received an average evaluation of 4.82/5. In 2018, I was awarded the Harvey N Davis

Distinguished Award for teaching excellence. Also, in 2018, as part of the Dean's initiative to improve labs across the school, I was awarded \$30,000 to improve the hands-on experiences in a core undergraduate course.

2014 – 2020	Introduction to Biomedical Instrumentation (Undergrad Core), Overall evaluation 4.83/5
2016 – 2020	Introduction to Brain Machine Interfaces (Grad/ Undergrad), Overall evaluation, 4.73/5
2013 – 2020	Introduction Biomedical Engineering (Undergraduate Core), group taught course
2018 – 2020	Stevens Pinnacle Scholars Seminar Course (Undergraduate Seminar)
2016 – 2017	Research Seminar in Biomedical Engineering (Undergraduate Core), group taught course