Pratool Bharti

Contact Information

Department of Computer Science
Psychology-Computer Science
Building, Room 469
Nothern Illinois University
Dekalb, IL 60115 USA

Voice: 573-466-3209
E-mail: pbharti@niu.edu
Google Scholar: http://bit.ly/2FRnZ2K

Primary Research Interests

Context-Aware Sensor Fusion, Embedded Machine Learning/ Artificial Intelligence, Computer Vision and Neural Networks

Secondary Research Interests

Smart and Connected Healthcare, Intelligent Transportation Systems, Pervasive Systems, Participatory Sensing

Professional Experience

Assistant Professor - Department of Computer Science
Northern Illinois University (Aug, 2019 — Present)

Visiting Faculty - Faculty Research Participation Program
Argonne National Lab (May, 2020 — Aug, 2020)

Research & Development Manager - Machine Learning Division
Communication Concepts Integration Inc., Odessa (Jun, 2017 — Present)

Artificial Intelligence Graduate Student Ambassador
Intel Corp. (Dec, 2016 — Dec, 2017)

Research/ Teaching Assistant - Department of Computer Science & Engineering
University of South Florida, Tampa (Aug, 2015 — Dec, 2017)

Research Intern
SmartCare Systems, St. Charles (May, 2015 — Aug, 2015)

Research/ Teaching Assistant - Department of Computer Science
Missouri University of Science and Technology, Rolla (Jan, 2014 — May, 2015)

Systems Engineer - Health Insurance Division
TATA Consultancy Services, Chennai, India (Aug, 2010 — Dec, 2013)

Education

University of South Florida, Tampa, FL, U.S.A.
Ph.D. in Computer Science and Engineering, Dec 2017
Dissertation: Context Based Human Activity Recognition using Multi-modal Wearable Sensors
Advisor: Dr. Sriram Chellappan.

Missouri University of Science and Technology, Rolla, MO, U.S.A.
Ph.D. Student in Computer Science, Jan, 2014 - May, 2015 (Later transferred to USF, Tampa)

Kalyani Government Engineering College, Kalyani, West Bengal, India
B-Tech. in Computer Science & Engineering, Aug, 2006 - Jul, 2010.

Awards

IEEE PerCom Conference **Travel Grant** Award, 2015.
Tata Consultancy Services **Gems** Award, [2011, 2013].
Merit-and-Means full Scholarship award for Undergraduate Study, (Jun 2006 - Jun 2010).

Patents

Sriram Chellappan, **Pratool Bharti**, Mona Minakshi, Willie McClinton, and Jamshidbek Mirzakhalov. "Leveraging smart-phone cameras and image processing techniques to classify mosquito genus and species." U.S. Patent Application 16/673,641, filed May 7, 2020.

Refereed Journal/ Magazine Publications

Mona Minakshi , **Pratool Bharti**, Tanvir Bhuiyan, Sherzod Kariev, and Sriram Chellappan, "A framework based on deep neural networks to extract anatomy of mosquitoes from images." in *Nature Scientific Reports 10*, August 2020.

Pratool Bharti, Debraj De, Sriram Chellappan and Sajal Das, "HuMAn: Complex Activity Recognition with Multi-modal Multi-positional Body Sensing", in IEEE Transactions on Mobile Computing (TMC), Vol 18/4, April 2019.

Pratool Bharti, Anurag Panwar, Ganesh Gopalakrishna, and Sriram Chellappan, "WatchDog: Detecting Self-Harming Activities from Wrist Worn Accelerometers", in `IEEE Journal of Biomedical and Health Informatics (J-BHI)`, Vol 22/3, May 2018.

Anthony Windmon, Mona Minakshi, **Pratool Bharti**, Sriram Chellappan, Marcia Johanssen, Bradlee Jenkins and Ponrathi Athilingam, "TussisWatch: A Smart-phone System to Identify Cough Episodes as Early Symptoms of Chronic Obstructive Pulmonary Disease and Congestive Heart Failure", in IEEE Journal of Biomedical and Health Informatics (J-BHI), Vol 23/4, July 2019.

Kaoutar Ben Ahmed, Bharti Goel, **Pratool Bharti**, Sriram Chellappan and Mohammed Bouhorma, "Leveraging Smartphone Sensors to Detect Distracted Driving Activities", in IEEE Transactions on Intelligent Transportation Systems (T-ITS), Vol 20/9, Sep 2019.

Srinivas Thandu, **Pratool Bharti**, Sriram Chellappan and Zhaozheng Yin, "Leveraging Multimodal Smartphone Sensors for Ranging and Estimating the Intensity of Explosion Events", in `Special Issue on Emerging Technologies in Pervasive Sensing, Journal of Pervasive and Mobile Computing (PMC)`, Vol 20/1, Sept 2017.

Debraj De, **Pratool Bharti**, Sajal K. Das and Sriram Chellappan, "Multimodal Wearable Sensing for Fine-Grained Activity Recognition in Healthcare", in `IEEE Internet Computing (IC)`, Vol 19/5, Sept-Oct 2015.

Refereed Conferences/ Workshop Publications

Priyanjani Chandra, **Pratool Bharti**, and Michael Papka, "A Computer Vision and AI Based Solution to Determine the Change in Water Level in Stream", a poster in `The International Conference for High Performance Computing, Networking, Storage, and Analysis (IEEE/ ACM SC)`, 2020.

Venkata Devesh Reddy Seethi, and **Pratool Bharti**, "CNN-based Speed Detection Algorithm for Walking and Running using Wrist-worn Wearable Sensors" in `IEEE International Workshop on Deep Learning on Edge for Smart Health and Well-being Applications`, 2020.

Mona Minakshi, **Pratool Bharti**, Willie B. McClinton III, Jamshidbek Mirzakhalov, Ryan M. Carney, and Sriram Chellappan, "Automating the surveillance of mosquito vectors from trapped specimens using computer vision techniques"in `ACM Conference on Computing and Sustainable Societies (ACM COMPASS)`, 2020.

Pratool Bharti, Arup Kanti Dey, Sriram Chellappan and Theresa Beckie, "An Experimental Investigation Comparing Age-Specific and Mixed-Age Models for Wearable Assisted Activity Recognition in Women", in `Proc. of 12th International Conference on Health Informatics (HealthInf)`, Prague, Czech Republic, 2019.

Mona Minakshi, **Pratool Bharti** and Sriram Chellappan, "Leveraging Smart-Phone Cameras and Image Processing Techniques to Classify Mosquito Species", in `Proc. of 15th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous)`, New York City, Nov 2018.

Bharti Goel, Arup Kanti Dey, **Pratool Bharti**, Kaoutar Ben Ahmed and Sriram Chellappan, "Detecting Distracted Driving Using a Wrist-Worn Wearable", in `Proc. of Workshop on Sensing Systems and Applications Using Wrist Worn Smart Devices (WristSense) in conjunction with IEEE Intl. Conf. on Pervasive Computing and Communications (PerCom)`, Athens, Mar 2018.

Mona Minakshi, **Pratool Bharti**, and Sriram Chellappan, "Identifying Mosquito Species using Smart-Phone Cameras", in `Proc of European Conference on Networks and Communications (EuCNC)`, Oulu, Finland, June 2017.

Anurag Panwar, Mariam Al-Lami, **Pratool Bharti**, Sriram Chellappan and Joel Burken, "Determining the Effectiveness of Soil Treatment on Plant Stress using Smart-phone Cameras", in `Proc. of IEEE Intl. Conf. on Selected Topics in Mobile and Wireless Networking (MoWNet)`, Cairo, Egypt, Apr, 2016.

Srinivas Thandu, Levi Malott, **Pratool Bharti** and Sriram Chellappan, "On the Feasibility of Leveraging Smartphone Accelerometers to Detect Explosion Events", in `Proc. of IEEE Intl. Conf. on Mobile Data Management (MDM)`, Pittsburgh, June 2015.

Levi Malott, **Pratool Bharti**, Nicholas Hilbert, Sriram Chellappan and Ganesh Gopalakrishna, "Detecting Self-harming Activities with Wearable Devices", in `Proc. of Workshop on Sensing Systems and Applications Using Wrist Worn Smart Devices (WristSense) in conjunction with IEEE Intl. Conf. on Pervasive Computing and Communications (PerCom)`, St. Louis, Mar 2015.

Teaching Interests

Core courses - Analysis of Algorithms, Computer Architecture, Operating Systems, Automata, Database Systems, Computer Networks, Data Structures and Programming
Specialized courses - Machine Learning/ Artificial Intelligence, Pervasive Computing and Computer Vision

Teaching and Mentoring Experience

Instructor - Neural Networks for Computer Vision (UG/G), Fall 2019, Fall 2020.

Instructor - Applied Machine Learning (UG/G), Spring 2020.

Teaching Assistant - Advance Network Security (G), Spring 2015.

Teaching Assistant - Introduction to Operating Systems (UG), Spring 2014, Fall 2014.

Invited Talks/ Panel Discussion

"A Hands-on Python Tutorial on Text-mining techniques"
- Big Ideas Lecture Series, Northern Illinois University, DeKalb (Apr 2020).

"Context-aware Machine Learning Models for Personalized and Public Health"
- Argonne National Lab, Lemont, IL (Nov 2019).

"Context-aware Machine Learning Models for Personalized and Public Health"
- Big Ideas Lecture Series, Northern Illinois University, DeKalb (Oct 2019).

"Complex Activity Recognition with Multi-Modal Multi-positional Body Sensing"
- 6th International Conference on Biostatistics and Bioinformatics, Atlanta, GA (Nov 2017).

"Identifying Mosquito Species Using Smartphone Cameras"
- Artificial Intelligence session organized by Intel Corp. at ACM SIGCSE (Special Interest Group of Computer Science Education) Conference, Seattle, WA (Mar 2017).

"Opportunities and Challenges in Implementing/Deploying AI"
- Artificial Intelligence panel discussion organized by Intel Corp. at South by Southwest (SXSW) Conference & Festivals, Austin, TX (Mar 2017).

Professional Committees

NSF Panelist: Multimodal Sensor Systems for Precision Health Enabled by Data Harnessing, Artificial Intelligence, and Learning (SenSE) [2020], SBIR/ STTR programs for Artificial Intelligence, Machine Learning, Natural Language Processing Technologies, [2017, 2018].

NIDILRR Panelist: Field Initiated Research Grants Competition [2020]

Undergrad Curriculum Committee: Assist committee in creating a comprehensive 4-year computer science undergraduate curriculum [2019, 2020].

TPC Member: 9th International Conference on Computational Data and Social Networks (CSoNet), Dallas, Dec 2020.

TPC Member: 38th IEEE International Conference on Computer Design (ICCD), Online, Oct 2020.

Track Co-chair & TPC Member: 6th International Conference on Networking, Systems and Security (NSysS), Dhaka, Dec 2019.

TPC Member: 13th International Conference on Wireless Algorithms, Systems and Applications (WASA), Tianjin, June 2018.

Reviewer Committee: IEEE Trans. on Mobile Computing (TMC), IEEE Trans. on Intelligent Transportation Systems (T-ITS), IEEE Trans. on Network Science and Engineering (TNSE), IEEE Sensors, MDPI Sensors, MDPI Applied Sciences.

Current Advisees

Mr. Venkata Devesh Reddy Seethi
Thesis topic : Human activity recognition using wearable sensors and computer vision

Ms. Priyanjani Chandra (co-advised with Dr. Michael Papka)
Thesis topic : Water level detection in a stream using computer vision techniques

Mr. Mrinmoy Roy (co-advised with Dr. Hamed Alhoori)
Thesis topic : AI-based personalized health monitoring system based on off-the-shelves smartwatches

References

Dr. Sriram Chellappan Associate Professor - Dept. of Computer Science and Engineering, University of South Florida, ENB, 4202 E. Fowler Avenue, Tampa, FL 33620, USA, Phone: 813-974-1379, Fax: 813-974-5456, Email: sriramc@usf.edu.

Dr. A. B. M. Alim Al Islam Associate Professor - Dept. of Computer Science and Engineering, Bangladesh University of Engineering and Technology, New Academic Building, West Polashi, Dhaka 1000, Bangladesh, Phone: 880-2-9665650/7109, Email: alim_razi@cse.buet.ac.bd.

Dr. Yasin Yilmaz Assistant Professor - Dept. of Electrical Engineering, University of South Florida, ENB, 4202 E. Fowler Avenue, Tampa, FL 33620, USA, Phone: 813-974-4788, Email: yasiny@usf.edu.