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Engineering & Scientific Consulting

Surya Sharma, Ph.D.

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Professional Profile

Dr. Sharma's training and fields of specialization are in electrical engineering and computer science with over a decade of experience. His expertise spans wearable and medical devices, computer vision, machine learning, and artificial intelligence (ML/AI) systems. He has also made notable contributions in defect inspection systems, control systems, automobiles, micro-mobility devices, internet of things (IoT) devices, and software development for embedded systems, desktops, mobile devices, and the web. His expertise is regularly sought in commercial and litigation matters including patent, copyright, trade secret, commercial and civil matters.

Dr. Sharma has published several papers on deep learning, sensors, metrics, big data, and real-world data. He has served as a peer reviewer for journals focused on biomedical engineering, sensors, machine learning, healthcare, and artificial intelligence, and he is a member of the NIST Artificial Intelligence Safety Institute Consortium (AISIC).

Dr. Sharma has provided technical leadership in the employment of technology for organizational management, email and web server management, web hosting, marketing campaigns, customer engagement, visitor tracking and social media management.

He has consulted on machine learning, artificial intelligence, and generative AI, including technologies such as synthetic datasets, Large Language Models (LLMs) and retrieval augmentation generation (RAG). His projects often involve using image processing and machine learning for material science and other scientific domains.

In the field of digital forensics, Dr. Sharma possesses expertise in recovering and reconstructing information from various digital devices. He has performed reverse engineering and analysis of software, firmware, electronic circuits, electronic chips, laptops, mobile phones, servers, networks, digital and network video recorders, and automobile systems. His work includes investigating wireless communications technologies such as 4G, 5G, Wi-Fi and Bluetooth, and analysis and testing of security measures in computers, mobile apps, websites, electronic circuits, network communications, proximity cards, and automobiles.

Prior to joining Exponent, Dr. Sharma held multiple roles at Clemson University. His teaching responsibilities included courses on software development, programming, machine learning, artificial intelligence, image processing, signal processing, assembly programming, embedded computing, operating system kernels, robotics, game design, and electrical engineering.

His research at Clemson focused on developing hardware and software for mobile health (mHealth) and electronic health (eHealth) wearable devices. He led large-scale data collection efforts from human participants and developed TensorFlow and Keras models using Clemson's Palmetto Supercomputer,

deploying these models to Android and Apple watch platforms. Additionally, he setup computer labs and networks, and created solutions for tracking worker migration during the COVID-19 pandemic in India.

Dr. Sharma also contributed to Industry 4.0 research by developing a camera-based real-time defect inspection system for Samsung's manufacturing plants. He developed software, libraries, and APIs using tools such as C, C++, C#, OpenCV, Linux, and Microsoft's Visual Studio.

Before joining Clemson University, Dr. Sharma worked as a freelance web and graphics designer, developing ecommerce stores, video-sharing platforms, news websites, and blogs using frontend like HTML, JavaScript, and PHP, as well as backend database management systems.

Academic Credentials & Professional Honors

Ph.D., Computer Engineering, Clemson University, 2020

M.S., Computer Engineering, Clemson University, 2014

B.E., Electronics & Telecommunications Engineering, University of Mumbai, India, 2012

Academic Appointments

Graduate Teacher of Record, Basic Electrical Engineering, Clemson University, 2020

Graduate Teacher of Record, Basic Electrical Engineering, Clemson University, 2014

Graduate Teacher of Record, Programming in MATLAB, Clemson University, 2014

Teaching Assistant, Robotics Creative Inquiry, Clemson University, 2013 - 2015

Teaching Assistant, Basic Electrical Engineering, Clemson University, 2013

Prior Experience

Research Assistant, Clemson University, 2015 - 2020

Chief Technical Strategist, eArth Samvarta Foundation, 2018 – 2020

Consultant, SAAPE Designs. Inc, 2017

Freelance Website Designer, 2008 - 2010

Professional Affiliations

Member, IEEE

Member, ACM

Languages

Hindi

Publications

H. Kouhani, K. Murray, Z. Lamport, and S. Sharma "Wearable Electronic Devices and Technologies". Computer Engineering Applications in Electronic, Biomedical, and Automotive Systems. D'Andrade B

(ed). Nova Science Publishers Inc., 2024.

S. Sharma, J. Maragh, S. Han, C. Yi, and C. Chen "Applied Image Processing and Computer Vision for Materials Science & Engineering". Computer Engineering Applications in Electronic, Biomedical, and Automotive Systems. D'Andrade B (ed). Nova Science Publishers Inc., 2024.

Sharma, Surya, and Adam Hoover. "Top-down detection of eating episodes by analyzing large windows of wrist motion using a convolutional neural network." Bioengineering 9, no. 2 (2022): 70.

Sharma, Surya, and Adam Hoover. "The Challenge of Metrics in Automated Dietary Monitoring as Analysis Transitions from Small Data to Big Data." 2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM). IEEE, 2020.

Sharma, Surya, et al. "The Impact of Walking and Resting on Wrist Motion for Automated Detection of Meals." ACM Transactions on Computing for Healthcare 1.4 (2020): 1-19.

Sharma, Surya, and Adam Hoover. "A Study on Linear Acceleration of the Wrist During Free-Living." 2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM). IEEE, 2019.

Sharma, Surya, et al. "Automatic Detection of Periods of Eating Using Wrist Motion Tracking." 2016 IEEE First International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE). IEEE, 2016.

Soleimani, Arash, Kyle Smith, Jiawei Zeng, Keith E. Green, Danielle Herro, Jessie Santiago, Surya Sharma et al. "Learning with CyberPLAYce, a Cyber-physical Learning Environment for Elementary Students Promoting Computational Expression." CHI'14 Extended Abstracts on Human Factors in Computing Systems, pp. 165-166. 2014.

Iyer, A., Sharma, S., "Inertial Measurement and Filtering of a UAV Flight," International Journal of Scientific & Engineering Research, Volume 4, Issue 2, 2013.

Presentations

S. Sharma and E. Groves. “Navigating Regulatory Changes Impacting AI/ML Enabled Devices and Cybersecurity”. Hosted by IEEE Product Safety Engineering Society (PSES) on November 29, 2023.

Sorini A, Wales, J, Sharma S. Cryptocurrency: What Is It and Why We Need to Know About It. 2022 FDCC Winter Meeting. March 8, 2022.

Sharma, Surya, and Adam Hoover. "The Challenge of Metrics in Automated Dietary Monitoring as Analysis Transitions from Small Data to Big Data.", Workshop in Artificial Intelligence Techniques for Biomedicine and Healthcare (AIBH) at 2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), Seoul, South Korea.

Sharma, Surya, and Adam Hoover. "A Study on Linear Acceleration of the Wrist During Free-Living", Workshop on Biomedical and Health Informatics (BHI) at 2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), San Diego, CA.

Adam Hoover, and Surya Sharma. “The Impact of Secondary Activities on Automated Detection of Meals”, invited talk at the IEEE Workshop on Automated Dietary Monitoring, May 2019, Chicago, IL.

Sharma, Surya, and Adam Hoover. "The Quantification of Accelerometer Noise Experienced During Wrist Motion." 2019 IEEE International Conference on Biomedical and Health Informatics (BHI), Chicago, IL.

Sharma, Surya, and Adam Hoover. "An Evaluation of an Eating Activity Detection Algorithm on 408 People." 2018 IEEE International Conference on Biomedical and Health Informatics (BHI), Las Vegas,

NV.

Sharma, Surya, et al. "Automatic Detection of Periods of Eating Using Wrist Motion Tracking." 2016 IEEE First International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE), Washington D.C.

Sharma, Surya “Bite Counting: A Simpler Approach to Dealing with Obesity”, invited talk, Clemson Board of Visitors meeting, 2014.

Additional Education & Training

AI for Medical Diagnosis, Deeplearning.ai, April 2020, Credential ID AMZJRYV59HQW

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Deeplearning.ai, April 2018, Credential ID YE68399LVPN2

Neural Networks and Deep Learning, Deeplearning.ai, April 2018, Credential ID EV9S2MNJ5XQT

Research Grants

Visual Defect and Inspection System, Samsung, Research Assistant, $140,624 ($140,624), 2018-2019.

Using Context to Validate and Improve Wrist-Tracking Measures of Eating Activity, NIH, Research Assistant, $1,746,064 ($702,656), 2015-2019.

Peer Reviews

IEEE Journal of Biomedical, Health and Informatics (IEEE JBHI)

MDPI Electronics

MDPI Applied Sciences

2020 25th International Conference on Pattern Recognition (ICPR 2020)

2019 IEEE International Conference on Biomedical and Health Informatics (BHI’19)

2019 IEEE-EMBS International Conference on Wearable and Implantable Body Sensor Networks (BSN ’19)

2018 IEEE-EMBS International Conference on Wearable and Implantable Body Sensor Networks (BSN ’18)