NEHA SHARMA

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EDUCATION

Simon Fraser University, Burnaby, Canada Sep 2018 - May 2024 (Expected)
Ph.D. in Computer Science (4.00 GPA)
Supervisor: Prof. Mohamed Hefeeda

Motilal Nehru National Institute of Technology, Allahabad, India Jul 2011 - May 2015
B.Tech. in Computer Science

PUBLICATIONS

[1] **Sharma, N.**, and Hefeeda, M. GlucoSense: Blood Glucose Sensing on Mobile Devices. In Preparation for *ACM SIGCOMM*, August 2024

[2] **Sharma, N.**, Waseem, S., Mirzaei, and Hefeeda, M. MobiSpectral: Hyperspectral Imaging on Mobile Devices. In Proceedings of *ACM Mobile Computing and Networking (MobiCom'23)*, October 2023

[3] **Sharma, N.** Enabling Wide Adoption of Hyperspectral Imaging. In Proceedings of *ACM Multimedia Systems (MMSys'21)*, June 2021

[4] Azadi, P., **Sharma, N.**, and Hefeeda, M. Enabling Hyperspectral Imaging in Diverse Illumination Conditions for Indoor Applications. In Proceedings of *ACM Multimedia Systems (MMSys'21)*, July 2021

[5] **Sharma, N.**, and Hefeeda, M. Hyperspectral Reconstruction from RGB Images for Vein Visualization. In Proceedings of *ACM Multimedia Systems (MMSys'20)*, June 2020

[6] Mohajerani, S., Asad, R., Abhishek, K., **Sharma, N.**, Duynhoven, A., and Saeedi, P. Cloud-MaskGAN: A Content-Aware Unpaired Image-to-Image Translation Algorithm for Remote Sensing Imagery. In *IEEE International Conference on Image Processing (ICIP)*, September 2019

[7] **Sharma, N.**, Singh, P., and Atrey, P. SecureCMerge: Secure PDF Merging Over Untrusted Servers. In *IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR)*, April 2018.

RESEARCH EXPERIENCE

IBM Research - Almaden Lab May 2023 - Aug 2023
Research Scientist Intern (w/ Luyao Shi, Ehsan Degan, Vandana Mukherjee)
Data Free Model Fusion for Medical Image Segmentation

· Developing a data free deep learning model fusion technique for skin lesion segmentation.

IBM Research - Almaden Lab May 2022 - Aug 2022
Research Intern - Impact Science (w/ Thomas Zimmerman, Vandana Mukherjee)
Modelling Airborne Transmission of SARS-CoV-2 using CO_2 as a proxy

· Developed a risk assessment framework using CO_2 as a proxy for safe indoor office work spaces.

Simon Fraser University Sep 2018 - Present
Research Assistant in the Network and Multimedia Systems Lab (NMSL)
Enabling Wide Adoption of Hyperspectral Imaging

· MobiSpectral: Hyperspectral Imaging on Mobile Devices

University at Albany, SUNY   Jun 2017 - Nov 2017
Research Intern(remote) w/ Prof. Pradeep Atrey
SecureCMerge: Secure PDF Merging Over Untrusted Servers

- Developed a practical windows application for securely merging PDFs over untrusted third-party servers using the merge-homomorphism property of Shamir's secret sharing. [Demo]

Indian Institute of Technology (IIT), Roorkee, India   Dec 2013
Research Intern w/ Prof. R. Balasubramanian
Image Compression using Huffman coding and JPEG

- Worked on image compression techniques using Huffman coding and JPEG, performing detailed analysis using compression ratios of multiple images.

Motilal Nehru National Institute of Technology, Allahabad   Jul 2014 - May 2015
Undergraduate Research Project w/ Prof. Krishna K. Mishra
Multi-Objective Optimization using Non Dominated Sorting PSO

- Implemented a modified PSO using effective non-dominated comparisons of a particle's best with its offspring for optimization of multiobjective functions in CEC2009 benchmark.

COURSEWORK

Design and Analysis of Algorithms, Machine Learning, Internet Architecture and Protocol, Multimedia Systems, Frontiers of Visual Computing, Computational Photography, Algorithms of Optimization

MAJOR PROJECTS

Hyperspectral Reconstruction from RGB Images for Vein Visualization [project]

- Proposed a data-driven framework using deep residual networks to reconstruct hyperspectral images from RGB images. Our method is the first to produce hyperspectral recovery from RGB beyond the visible spectrum.
- Developed a human vein visualization application using proposed framework useful in medical diagnosis and forensics.

CloudmaskGAN: A Content-Aware Unpaired Image-To-Image Translation Algorithm for Remote Sensing Imagery

- Designed CloudmaskGAN, a modification of CycleGAN, which can preserve the locations and the intensity values of the cloud pixels during an unpaired image-to-image translation process with the goal of broadening the training dataset.
- Quantitative results obtained from segmentation indicated that the network trained with the CloudmaskGAN augmentation had improved capabilities of cloud segmentation, yielding improvements of 2.02% and 1.24% for Jaccard index and segmentation accuracy, respectively.

Moodify: Emotion Based Music Recommendation System using DenseNet

- Developed a web-based recommendation system based on emotional computing, automatic classification and feature extraction, which recommends music based on the mood of the user.
- Designed a haar feature-based cascade classifier for face detection, a deep feature learning approach using dense convolutional networks (DenseNet) for emotion classification and multi-class Support Vector Machine (SVM) for music mood classification.

Towards Green Internet : A Survey

- Explored some hot green technologies such as green radio-frequency identification, green wireless sensor network, green cloud computing and green data center, provided an overview regarding green Internet of Things (IoT) for sustainable smart world.

WORK EXPERIENCE

Infoedge India Limited (99acres.com)   June 2016 - August 2018
Senior Software Engineer

· Designed and implemented consolidated user management system to perform authentication and authorization of all users, with privilege management based on RBAC and DAC model.
· Devised a generic event-based auditing framework for screening workflows of property and profile, such that, integration of framework can be done using annotations only.
· Analyzed software requirements to provide optimized design, evaluation, conceptualization, technology mapping and final execution.
· Performed Code Reviews, Quality Check, Deployment, Live Monitoring, Performance Testing and Scrum Master role in agile workflow.
· Mentored new employees on domain and process knowledge

Infoedge India Limited (99acres.com)   June 2015 - May 2016
Software Engineer

· Migrated Legacy core module to the Web Services architecture using JAVA/ SPRING framework.
· SEO(Search Engine Optimization) projects, including successful HTTPS migration of site, meta tags optimization, page linking which led to increase in organic site traffic to around 10%.
· Designed architecture and implemented end to end solutions to meet business requirements.
· Gained exposure to all phases of the Software Development Life Cycle including Projects Planning & Implementation, Requirement Gathering and Analysis, Design & Development, Deployment, Testing and Maintenance.
· Developed and maintained core modules required by the application

AWARDS AND HONORS

ACM MMSys Web & Social Media Chair	**Jun 2023**
ACM MMSys Doctoral Symposium (work selected to present)	**Sep 2021**
BC AI Showcase (work selected to present)	**Nov 2020**
Simon Fraser Graduate Fellowship	**Jan 2020**
Simon Fraser Graduate Fellowship	**May 2019**
CRA-W Grad Cohort Invitation and Travel Grant	**Apr 2019**
AI Student Showcase Best Poster Award	**Dec 2018**
Simon Fraser Graduate Fellowship	**Sep 2018**
Special Graduate Entrance Scholarship	**Sep 2018**

SKILLS

Programming Languages	Python, C/C++, C#, Java, MATLAB, Shell scripting, HTML
Software & Tools	PyTorch, TensorFlow, Keras, LaTeX, OpenCV, Git, Linux

ACADEMIC PARTICIPATION / TEACHING

SFU CMPT 120 (Intoduction to Programming)	*Teaching Assistant*	Jan - Apr 2023
SFU Outreach Python For Data Science	*Instructor*	Feb'22, Apr'23
Invent the Future Event (AI4ALL) at SFU	*Curriculum Developer*	Mar 2022
ACM MMSys Conference	*Participant*	Sep 2021
SIGCOMM Conference	*Attendee*	Aug 2020
Invent the Future Event (AI4ALL) at SFU	*Project Mentor*	Jul 2020
ACM MMSys Conference	*Participant*	Jun 2020
Invent the Future Event (AI4ALL) at SFU	*Program Mentor*	Jul 2019
Women in Computing Science (WiCS) at SFU	*Member*	Sep 2018 - Present