ISHAN NIGAM

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Education

Masters in Computer Science, The University of Texas at Austin, USA. Aug 2019 - May 2023	GPA: 4.00
Masters in Robotics, Carnegie Mellon University, USA. Aug 2016 - May 2018	GPA: 3.91
BE in Information Technology, NSIT, University of Delhi, India. Aug 2010 - Jun 2014	71.2%

Skills

Python, C++, PyTorch, TorchVision, Captum, XGBoost, Scikit-Learn, Pandas, NumPy, SciPy.

Research Experience

Fair Regression for Homelessness Resource Allocation [P01@ASIST'22 C, P02@JASIST'22 C] 08/21-12/22 Created constrained optimization framework resulting in 27.05% reduction in relative demographic disparity (20.7% \rightarrow 15.1%) in county-wide housing resource allocation decisions while maintaining predictive performance.

Participatory Algorithms: Personalized Models for Resource Allocation [P03@AIES'21] 05/20-10/20 Implemented automated resource allocation with stated preference elicitation through binary discrete-choice experiments. 84.04% accuracy in per-person linear models enabled constrained optimization over individual preferences.

Weakly Supervised Latent Attribute Discovery [P04@ICCV'19] 10/17-09/18Developed Latent Similarity Networks using triplet similarity comparisons (modeling click data) that discover the underlying latent taxonomy circumventing cultural and linguistic norms. Scalable to webly supervision. Resulted in relative improvements of 10.62% on Zappos Shoes dataset and 7.82% on Celeb-A Faces dataset.

Spatio-Temporal Activity Detection

Led 3-student team on multi-PI million-dollar <u>IARPA DIVA</u> grant. Developed proposal-based temporal matching framework for multi-object tracking, which resulted in 16.85% relative improvement in $P_{\text{miss}}@0.1\text{RFA}$ (0.89 \rightarrow 0.74).

Ensemble Knowledge Transfer for Semantic Segmentation [P05@WACV'18] 10/16-09/17 Synthesized multi-source knowledge transfer harnessing visually distinct domains to improve semantic segmentation. Proposed method resulted in 9.73% relative improvement $(52.02\% \rightarrow 57.08\%)$ over single source networks.

Obfuscation Analysis of Iris Pattern Biometric Recognition [P06 C, P07 C, P08 C] 06/14 - 07/16Quantified iris obfuscation effects due to cataract surgery and related ophthalmic disorders. Proposed iris quality assessment framework resulting in discussions with India's Aadhar Program's Biometrics Committee.

Internships

3D Trajectory Planning for Drone Landing(Autel Robotics, USA) 06/17-08/17 Led development of the AeroScapes benchmark to improve 3D path planning using semantic pixel segmentation. Proposed method incorporated into drone's path planner for take-off and landing modules.

Real-Time XRay Super-Resolution(Imaging and Computer Vision, Siemens Research, India) 06/13-07/13Modeled sub-pixel motion using optical flow for super-resolution. Proposed method obtained real-time super-resolved video sequences leading to reduced patient dosage and higher signal-to-noise-ratio improving interventional procedures.

Awards and Achievements

- Best Paper Award at 85th Annual Meeting of Assoc. for Information Science & Technology (ASIST 2022) (P01 🗹).
- P07 C among top-2015 Elsevier publications. Featured in Special Issue of Image & Vision Computing.
- Best Poster Award at 7th IEEE BTAS Conference, Washington DC, USA (P11 🖉)
- Awarded Young Scientist Award by Government of India in 2015 for P11 2.

Graduate CourseWork & Teaching

- Coursework: Machine Learning, Deep Learning, Data Mining, Visual Learning and Recognition, Computer Vision.
- **TA**: Grad. Deep Learning, Grad. Neural Networks, Intro. to Data Mining, Intro. to Human Computer Interaction.

06/18-03/19

Publications

P01 Slota, <u>Nigam</u>, Fleischmann, Greenberg, Cruz. "From Communities of Practice to Smart and Connected Communities: Information Sharing Practices Among Social Service Providers" ASIST 2022 (Best Paper) [pdf]

P02 Slota, Fleischmann, Lee, Greenberg, <u>Nigam</u>, et al. "A feeling for the data: How govt. and non-profit stakeholders negotiate value conflicts in data science approaches to ending homelessness". **JASIST 2022** [pdf]

- P03 Lee, Nigam, Zhang, Afriyie, Qin, Gao. "Participatory Algorithmic Management: Elicitation Methods for Worker Well-Being Models". AIES 2021
- P04 Nigam, Tokmakov, Ramanan. "Towards Latent Attribute Discovery from Triplet Similarities". ICCV 2019 [pdf]

P05 Nigam, Huang, Ramanan. "Ensemble Knowledge Transfer for Semantic Segmentation". WACV 2018 [pdf]

- P06 Nigam, Keshari, Vatsa, Singh, Bowyer. "Phacoemulsification Cataract Surgery Affects Capacity of Iris Pattern Recognition". Nature Scientific Reports 2019 [IF: 4.99] [pdf]
- P07 Nigam, Vatsa, Singh. "Ocular Biometrics: Survey of Fusion & Modalities". Info. Fusion 2015 [IF: 12.9] [pdf]
- P08 Nigam, Vatsa, Singh. "Ophthalmic Disorder Menagerie and Iris Recognition". Springer's Handbook of Iris Recognition 2015 [pdf]
- P09 Nigam, Agrawal, Vatsa, Singh. "Revisiting HEp-2 Cell Classification". IEEE Access 2015 [IF: 3.6]. [pdf]
- P10 Nigam, Vatsa, Singh. "Leap Signature Recognition using HOOF and HOT features". ICIP 2014 [pdf]

P11 Chahar, Yadav, Nigam, Vatsa, Singh. "Leap Password Verification System". BTAS 2015 (Best Poster) [pdf]