

Sagnik Majumder

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EDUCATION

- MAY 2021 **University of Texas at Austin (UT)-Austin**, Texas, United States
Master of Science in COMPUTER SCIENCE; GPA: 3.92/4.0
- JULY 2018 **Birla Institute of Technology and Science (BITS)-Pilani**, Pilani, Rajasthan, India
Bachelor of Engineering (Hons.) in ELECTRONICS AND INSTRUMENTATION
Thesis: "Neural Architecture Meta-learning via Reinforcement" | Advisor: [Prof. V. RAMESH](#)
GPA: 9.55/10, Distinction and ranked 2nd out of 100 students

INTERNSHIPS AND RESEARCH

- JAN 2020 - present **Research assistant at UT Austin Vision Lab**
Advisor - [Prof. Kristen Grauman](#)
- Built an RL based state-of-the-art hierarchical audio-visual navigation system that combined a novel end-to-end waypoint prediction model and an analytical geometric motion planner, and also leveraged a novel acoustic map design
 - Working on embodied audio separation using active audio-visual learning
- AUG 2019 - DEC 2019 **Student in Graduate Natural Language Processing course at UT Austin**
Advisor - [Prof. Greg Durrett](#)
- Built a novel state-of-the-art adversarial defense for question answering that uses a model-agnostic answer reranking mechanism by computing named entity overlap between questions and candidate answers
- JAN 2018 - MAY 2019 **Research assistant at Goethe University**
Advisor - [Prof. Visvanathan Ramesh](#)
- Built a continual learning framework by integrating a variational autoencoder based deep generative replay model and a statistical outlier rejection technique (OpenSet) that outperformed the state-of-the-art
 - Curated a novel concrete defect dataset; meta-learned task specific neural architectures that outperformed strong baselines and transfer-learned models
 - Investigated a common architectural design practice of monotonically increasing feature amounts with depth in CNNs, through parameterization of feature distribution across layers and obtained results that contradict this practice
- MAY 2017 - May 2019 **Research intern at Frankfurt Institute for Advanced Studies**
Advisor - [Prof. Christoph Malsburg](#)
- Created a distortion invariant handwritten digit recognition system with Gabor filters and an elastic graph matching algorithm
 - Worked on motion parameter estimation and prediction of rigid rotating objects and implemented a neural version of the Kalman filter

ALL PEER-REVIEWED PUBLICATIONS AND SUBMISSIONS

- Changan Chen, **Sagnik Majumder**, Ziad Al-Halah, Ruohan Gao, Santhosh K. Ramakrishnan, Kristen Grauman. "Audio-Visual Waypoints for Navigation". Under review at a **tier-1 ML conference**. [\[Preprint\]](#)
- **Sagnik Majumder**, Chinmoy Samant, Greg Durrett. "Model Agnostic Answer Reranking System for Adversarial Question Answering". Short paper under review at a **tier-1 NLP conference**. Preprint to be released soon.
- Martin Mundt, **Sagnik Majumder**, Iuliia Pliushch, Visvanathan Ramesh. "Unified Probabilistic Deep Continual Learning through Generative Replay and Open Set Recognition". To be submitted to a **tier-1 ML journal**. [\[Preprint\]](#), [\[Codebase\]](#)
- Martin Mundt, **Sagnik Majumder**, Sreenivas Narasimha Murali, Panagiotis Panetsos, Visvanathan Ramesh. "Meta-learning Convolutional Neural Architectures for Multi-target Concrete Defect Classification with the CONcrete DEfect BRidge IMage Dataset". **CVPR 2019**. [\[Main body\]](#), [\[Supplementary\]](#), [\[Codebase\]](#)
- Martin Mundt, **Sagnik Majumder**, Tobias Weis, Visvanathan Ramesh. "Rethinking Layer-wise Feature Amounts in Convolutional Neural Network Architectures". **NeurIPS 2018 Workshop: Critiquing and Correcting Trends in Machine Learning**. [\[Workshop web-page with link to publication\]](#), [\[Publication\]](#), [\[Codebase\]](#)
- Martin Mundt, Iuliia Pliushch, **Sagnik Majumder**, Visvanathan Ramesh. "Open Set Recognition Through Deep Neural Network Uncertainty: Does Out-of-Distribution Detection Require Generative Classifiers?". **ICCV 2019 Workshop: Statistical Deep Learning for Computer Vision**. [\[Publication\]](#)
- **Sagnik Majumder**, C. von der Malsburg, Aashish Richhariya, Surekha Bhanot, "Handwritten Digit Recognition by Elastic Matching" Journal of Computers vol. 13, no. 9, pp. 1067-1074, 2018. [\[Publication\]](#), [\[Codebase\]](#)
- Rishabh Bhardwaj, **Sagnik Majumder**, Pawan K. Ajmera, Soumendu Sinha, Rishi Sharma, R. Mukhiya, Pratik Narang. "Temperature compensation of ISFET based pH sensor using artificial neural networks". In: Micro and Nanoelectronics (RSM), 2017 IEEE Regional Symposium on. IEEE. 2017, pp. 155–158. [\[Publication\]](#)
- Rishabh Bhardwaj, Soumendu Sinha, Nishad Sahu, **Sagnik Majumder**, Pratik Narang, Ravindra Mukhiya. "Modeling and Simulation of Temperature Drift for ISFET based pH Sensor and its Compensation through Machine Learning Techniques ". International Journal of Circuit Theory and Applications 2019. [\[Publication\]](#)

COURSEWORK

Graduate:	Deep Learning Seminar; Reinforcement Learning: Theory & Practice; Robot Learning; Math in Deep Learning; Natural Language Processing; Algorithms: Techniques and Theory
Undergraduate:	Neural Networks & Fuzzy Logic; Machine Learning; Advanced Calculus; Linear Algebra and Complex Variables; Probability and Statistics; Computer Programming; Operating Systems; Object Oriented Programming; Advanced Computer Architecture
MOOC:	Data Structures (certificate); Algorithms (certificate); Discrete Mathematics (certificate); Stanford's CS231n: Convolutional Neural Networks for Visual Recognition ; Stanford's CS224n: Natural Language Processing with Deep Learning ; UC Berkeley's CS294: Deep Reinforcement Learning

PROFESSIONAL SERVICE

Reviewer: RAL '20; ICRA '20

SOFTWARE SKILLS

Programming Language: Python; C; C++; Java; Matlab
Autodifferentiation Framework: PyTorch; Tensorflow; Caffe
Python Package: Numpy; Scipy; SK-learn; Matplotlib; Seaborn; Plotly
Operating System: Linux (Debian, Ubuntu); MS Windows
Distributed Version Control: Git
Document Preparation: \LaTeX ; MS Word

ACADEMIC HONORS AND ACHIEVEMENTS

AUGUST 2018 TOEFL iBT: 116 (READING: 30, LISTENING: 29 SPEAKING: 27, WRITING: 30)
JULY 2018 GRE: 334 (QUANTITATIVE: 170, VERBAL: 164, AWA: 5.0)
JAN 2016 - JUN 2018 Received merit scholarship for academic excellence from BITS Pilani for 5 consecutive semesters
AUGUST 2017 Offered full-time role as machine learning engineer (software development) by the technology division of Goldman Sachs India
MARCH 2017 Secured 2nd place in paper presentation at APOGEE, BITS Pilani technical festival
DECEMBER 2016 Received DAAD WISE scholarship 2017 for research internship in Germany
JUNE 2014 Ranked in top 0.50% in IIT-JEE and 64 in WBJEE
FEBRUARY 2014 Offered KVPY fellowship by the Department of Science and Technology, Govt. of India

TEACHING EXPERIENCE

SEMESTER 1, 2017-18: Teaching assistant for "Neural Networks and Fuzzy Logic" at BITS Pilani

CO-CURRICULAR ACTIVITIES

2016-17: Project coordinator of Instrumentation Forum, BITS Pilani
2014-17: Member of BITS Firefox Community, Google Developers' Group and Instrumentation Forum at BITS Pilani

EXTRA-CURRICULAR ACTIVITIES

2016-17: Cultural secretary of Moruchhaya, the Bengali cultural association at BITS Pilani
2014-18: Member of Moruchhaya