

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

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| JAN 2020 - present | Research assistant at UT Austin Vision Lab
<i>Advisor - Prof. Kristen Grauman</i> <ul style="list-style-type: none">• Built an RL based state-of-the-art audio-visual navigation system with a novel subgoal prediction model and a novel acoustic memory design• Currently working on audio separation using active and embodied learning |
| AUG 2019 - DEC 2019 | Student in Graduate Natural Language Processing course at UT Austin
<i>Advisor - Prof. Greg Durrett</i> <ul style="list-style-type: none">• 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
<i>Advisor - Prof. Visvanathan Ramesh</i> <ul style="list-style-type: none">• 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 dataset for multi-target concrete bridge defect identification, 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
<i>Advisor - Prof. Christoph Malsburg</i> <ul style="list-style-type: none">• 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

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:	L ^A T _E X; 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 2 nd 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