Het Shah

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EDUCATION

B.E. Computer Science — Goa, India | Aug 2017 - Aug 2021

Birla Institute of Technology and Science Pilani, K. K. Birla Goa Campus

- Major: Computer Science | CGPA: 8.55
- Thesis: Incremental Learning for Animal Pose Estimation advised by Prof. Anirban Chakraborty

WORK EXPERIENCE

MICROSOFT RESEARCH | Research Fellow — Bangalore, India | Jun 2022 - Present

- Working with the PROSE team on developing a skill for **code edits for dotnet migration** for the **Copilot X** project in Visual Studio.
- The project aims to use semantic and syntactic information from the compiler to predict the edits.

MICROSOFT RESEARCH | Research Intern — Bangalore, India | Jun 2021 – May 2022

- Investigated the use of **Neuro-symbolic models** for representing the image data as programs.
- Explored the effectiveness of such models for **extracting data from chart images** (e.g., bar, line, and pie charts).

ESOWC, ECMWF | Summer Intern — Remote | May 2021 – Aug 2021

- Worked on calculating the Land Surface Temperature (LST) using information from other environmental variables.
- Developed a regression model using machine learning to predict LST and analyzed which environmental variables contribute to the change in LST.
- Achieved improvements of **2 Kelvin** (35%) for the UK region and **1 Kelvin** (20%) for the Lower European region compared to a simple numerical model.
- Links: **Certificate**, **Final Presentation**

VCL, INDIAN INSTITUTE OF SCIENCE | Research Intern — Bangalore, India | Nov 2020 - June 2021

- Worked on a novel problem of investigating **Incremental Learning for Pose Estimation**.
- Developed a new sampling strategy for building the **exemplar memory using RBF k-DPP** to mitigate forgetting.
- Further developed an **Image Warping Augmentation strategy** to augment the exemplar memory.
- Links: **Project Page, Code**

APPCAIR, BITS PILANI, GOA CAMPUS | Undergraduate researcher — Goa, India | Jan 2020 - Jan 2021

- Investigated using **transformers for basic algorithmic approximations** (e.g., floating-point number addition, dynamic programming task, and graph DFS). Our research demonstrated that transformers struggle to generalize outside distribution and can't handle these straightforward problems.
- Also worked on the topic of **Iterative Knowledge Distillation for Data Free Learning**. Developed a method for iteratively compressing models with GANs and proposed a loss function to keep training stable.
- Works done in collaboration with **TCS-Research**.

PUBLICATIONS

1. *Gaurav Kumar Nayak*, Het Shah*, Anirban Chakraborty*. Incremental Learning for Animal Pose Estimation using RBF k-DPP. *2021 British Machine Vision Conference (BMVC).*

2. *Het Shah*, Ashwin Vaswani*, Tirtharaj Dash, Ramya Hebbalaguppe, Ashwin Srinivasan*. Empirical Study of Data-Free Iterative Knowledge Distillation. *In: Farkaš I., Masulli P., Otte S., Wermter S. (eds) Artificial Neural Networks and Machine Learning – ICANN 2021. ICANN 2021. Lecture Notes in Computer Science, vol 12893. Springer, Cham.* $https://doi.org/10.1007/978-3-030-86365-4\_44$

3. *Ashwin Vaswani*, Rijul Ganguly*, Het Shah*, Sharan S. Ranjit, Shrey Pandit, and Samruddhi Bothara*. An Autoencoder Based Approach to Simulate Sports Games. *7th Workshop on Machine Learning and Data Mining for Sports Analytics at ECML-PKDD 2020*

4. *Het Shah*, *Avishree Khare*, *Neelay Shah*, *Khizir Siddiqui*. KD-Lib: A PyTorch library for Knowledge Distillation, Pruning, and Quantization. *Arxiv Pre-print*

OPEN-SOURCE CONTRIBUTIONS

KD-Lib May 2020 - Present

- A Pytorch Library that will help extend major works for **Knowledge Distillation, Pruning, and Quantization**.
- Designed the library's design and oversaw the project's implementation of knowledge distillation methods.
- The library currently has 450+ stars.
- Links: **Pre-print**, **Code**

GenRL Apr 2020 - Sep 2020

- GenRL is a PyTorch based **Reinforcement Learning library** centered around reproducible and generalizable algorithm implementations
- Contributed to the **DQN**, **VPG** and **SARSA** agents, and **vectorized Environments**.
- Links: **Code**

TEACHING AND REVIEWING

Teaching Assistant, Neuromatch Academy - Deep Learning Aug 2021

- Created content for the topic of "Out of Distribution Learning" and led tutorial sessions for a pod of 8 students.
- Links: **Certificate**

Teaching Assistant, Machine Learning, BITS Pilani, Goa Campus Aug 2020 - Dec 2020

- Responsible for conducting **coding sessions** and designed the **project assignments** for over 120 undergraduate students.
- Links: **Certificate**

Reviewer
JOSS (Journal of Open Source Software)

SUMMER SCHOOL

Google AI Research Summer School Aug 2020

- Among **150** students selected from all the institutes in India.
- Selected for the **AI4SG** track

Summer Symposium on AI Research Jul 2020

- Organized a two-day summer symposium on AI Research.
- Links: **Website**

SKILLS

Languages: Python , C++ , C, C#, JAVA, JavaScript, MySQL
Frameworks: PyTorch, Tensorflow, Keras, ReactJS, NodeJS, ExpressJS
Technology: Git, AWS

VOLUNTEERING

Teacher - Abhigyaan(NGO)
Vice President - Society for Artificial Intelligence and Deep Learning(SAiDL)