

Pulkit Madaan

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madaanpulkit.github.io | [in in/pulkit-madaan](https://in.in/pulkit-madaan) | madaanpulkit | [Pulkit Madaan](#)

EDUCATION

Johns Hopkins University

MSE Computer Science

Aug 2022 – May 2024 (Expected)

[Indraprastha Institute of Information Technology Delhi](#)

B.Tech in Computer Science and Applied Math

Aug 2016 – Aug 2020

CGPA: 9.23/10.0

Best Academic Performance in Major | [\[THESIS\]](#)

SKILLS

Languages: Python, Java, C++, Bash, R

Other: PyTorch, Jupyter, Git, Torchtext, LaTeX, Streamlit, Numpy, scikit-learn, PyTorch Lightning, Detectron2, Voxel51, Docker, Hydra, NNI.

EXPERIENCE

Associate ML Scientist - I

Jul'20 - Jul'22

[Wadhvani Institute for Artificial Intelligence](#)

[Agirculture Team](#), [Core ML Team](#)

[\[Code\]](#)

- Developed a flexible & generic Object Detection codebase with rejection, visualization & deployment capabilities, on top of PyTorch Lightning, Hydra, NNI.
- Improved the existing model, added new architectures & rejection framework incorporating on-ground feedback.
- Codebase Open-Sourced [\[Code\]](#).
- Solution won the Global Change Award 2022 [\[article\]](#).
- Built a prototype that uses remote sensing to advise farmers on the frequency and quantity of crop-specific irrigation.

Reconstruction Research Intern

May'20 - Jul'20

[IIIT-Delhi](#)

Advisor: [Dr. Kaushik Kalyanaraman](#), [Dr. Ojaswa Sharma](#)

- Extended 3D surface reconstruction from curved cross-sections' codebase for experiments and visualisation.

Bachelor's Thesis

Jan'19 - Dec'19

[IIIT-Delhi](#)

Advisor: [Dr. Saket Anand](#), [Dr. Sushil Mittal](#)

- Developed a model for better representation learning using deep neural clustering with mean-shift.
- The model learns a latent space that is clustered without the need for labels or number of clusters.

Mitacs Globalink Research Intern
[UQAM](#)

May'19 - Aug'19

Advisor: [Dr. Fatiha Sadat](#)

- Developed new data augmentations & training pipeline to improve Multilingual Neural Transformer for better translation of low-resource languages.
- Work accepted at [WILDRE-5](#) (part of [LREC 2020](#))

ACADEMIC SERVICE

- Served as a [Reviewer](#), [Programme Committee](#) at [The Second Workshop on Speech and Language Technologies for Dravidian Languages-ACL 2022](#).
- Volunteer at ICLR 2021.
- Course Assistant of Gateway Computing: Python at Johns Hopkins University.

PUBLICATIONS

- White, J., **Madaan, P.**, Shenoy, N., Agnihotri, A., Sharma, M., & Doshi, J. (2022). A Case for Rejection in Low Resource ML Deployment. ArXiv preprint [arXiv:2208.06359](#). [preprint] [\[LINK\]](#)
- **Madaan, P.**, Maiti, A., Anand, S., & Mittal, S. (2019). Deep Mean Shift Clustering. [preprint] [\[LINK\]](#)
- **Madaan, P.**, & Sadat, F. (2020, May). Multilingual Neural Machine Translation Involving Indian Languages. In Proceedings of the WILDRE5–5th Workshop on Indian Language Data: Resources and Evaluation (pp. 29-32).[\[LINK\]](#)

SELECT PROJECTS

Flow Based Generative Models: GLOW

Course: Probabilistic Graphical Models [\[Code\]](#) [\[Slides\]](#)

- Conditioned GLOW in different generation and conversion tasks (eg: replacement to vocoders, GANs)
- [PyTorch, Colab]

Emotional TTS

Course: Speech Understanding

[\[Code\]](#)

- Conditioned State-of-the-Art Text-To-Speech models, like Tacotron, on emotional labels to produce to non-robotic audios of a given text in a given emotion.
- [PyTorch, Librosa, Jupyter]

Doom Playing DeepRL Agent

Course: Reinforcement Learning

[\[Code\]](#) [\[Slides\]](#)

- Trained an agent using Deep Recurrent Q-Learning to play Doom: An FPS game having partially observable 3D states.
 - Added the capability to self-learn as the agent plays against self to train itself.
- [PyTorch, VizDoom, Jupyter]

AWARDS

- Part of Wadhvani AI team that won the HUL, Google and MyGov India's AI for Agriculture Hackathon. The winning prize was a grant of 1 Million INR.
- Best Academic Performance in B.Tech. CSAM [Branch Topper | Gold Medalist] [\[cert\]](#)
- Dean's Academic Excellence Award for 2 consecutive years: 2017-18, 2018-19 [\[cert\]](#)

RELEVANT COURSES

CS: Causal Inference, Machine Translation, Speech Recognition and Understanding, Reinforcement Learning, Deep Learning, Machine Learning, Digital Image Processing, Object Oriented Programming, Algorithms, Data Structures
Math: Differential Geometry, Calculus on \mathbb{R}^N , Numerical PDEs, Stochastic Processes, Statistical Inference, Linear Optimisation, Real Analysis, Abstract Algebra, Discrete Structures, Scientific Computing, ODEs & PDEs, Probability and Statistics, Linear Algebra

LEADERSHIP

Event Head, RoboWars | ESYA'17 (Technical Fest; IIIT-D)

- Headed & handled procurement, sponsorship, arena construction, logistics, security, scheduling & contest conduct end-to-end.