Mohit Yadav

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Education

University of Massachusetts Amherst — Amherst, MA, USA
Ph.D. in Computer Science — *August 2017- May 2023 (expected)*

- Advisors: Prof. Daniel Sheldon and Prof. Cameron Musco
- Research interests: Gaussian Processes and deep learning for NLP

University of Massachusetts Amherst — Amherst, MA, USA
M.S. in Computer Science — *August 2017 - January 2020*

- Advisors: Prof. Daniel Sheldon and Prof. Andrew McCallum

Indian Institute of Technology (IIT), Mandi — Mandi, India
B.Tech in Electrical Engineering — *July 2010 – June 2014*

Experience

Research Scientist Intern — June 2022 - August 2022
Etsy Inc. — *New York City, NY, USA*

Research Scientist Intern — June 2020 - August 2020
Allen Institute for Artificial Intelligence (AI2) — *Seattle, WA, USA*

Applied Scientist Intern — May 2018 - Aug 2018
Amazon Alexa NLU Team — *Boston, WA, USA*

Research Engineer — July 2014 - August 2017
TCS Research — *New Delhi, India*

Publications/Patents

Selected publications/submissions

- **M. Yadav**, H. Chaudhary, R. Louca, Y. Pan: *Scalable Gaussian processes Bandit Algorithms for Recommending Top-k Items*, (under submission).
- **M. Yadav**, D. Sheldon, C. Musco: *Kernel interpolation on sparse grids for Gaussian processes*; In **NeurIPS**-2022.
- **M. Yadav**, D. Sheldon, C. Musco: *Fast kernel interpolation for Gaussian processes*; In AISTATS-2021. (**Oral, top** 3%**,** 48/1527).
- **M. Yadav***, A. Drozdov*, P Verga*, M. Iyyer, A. McCallum: *Unsupervised latent tree induction with deep inside-outside recursive autoencoders*; In NAACL-2019. *Equal contributions. (**Oral, top** 9%**,** 91/1067).

Publications summary

- Conference: **NeurIPS**-22, **AISTATS**-21, **NAACL**-19, IJCNLP-17, **EACL**-17, NCC-16, PReMI-15, ICVGIP-14.
- Workshop: **ICCV**-17, **AAAI**-17, **NeurIPS**-15.
- Patents: 1 patent accepted at US-PTO. 2 patents under review at EPO and Indian patent office.

Research Projects – Gaussian Processes

Non-stationary kernel interpolation for Gaussian Processes

- Developed an interpolation method for non-stationary kernels for low-dimensional problems.
- Extended fast iterative algorithms for additive and projected kernels for GP inference.

Scalable Gaussian Processes Bandit Algorithms for Top-k Recommendations

- Developed a scalable bandit algorithm using for GP with sub-linear regret in the number of rounds.
- The algorithm accounts for user context information as well as can run in the batch mode across users.

Faster kernel interpolation for Gaussian Processes

- Developed fast algorithms for GP inference scalable up to million data points. (AISTATS-2021)
- Applied *sparse grids* – an numerical linear algebraic approach to accelerate GP inference. (NeurIPS-2022)

Research Projects – Deep learning for NLP

Scalable information extraction for long documents (@ Allen Institute for AI)

- Developed a transformer model to extract n-array biomedical relations from documents up to $10K$ tokens.
- Relationships between mentions are efficiently represented by structuring the self-attention module.

Unsupervised representation learning via latent tree induction (with Prof. Andrew McCallum)

- Introduced a fully-unsupervised method for discovering syntax that simultaneously learns representations for constituents of a sentence within the induced tree. (Published at NAACL-19)

Transfer Learning for Low-resource Language (@ ALexa, NLU Internship)

- Developed a method to adapt embeddings of resource rich languages to low-resource languages.
- Slot filling system for the Alexa is trained in low-resource languages using a few labelled data points.

Representation Learning and Knowledge Transfer for Question Answering (@ TCS Research)

- Proposed *curriculum* learning for training deep neural networks. Shown knowledge transfer through word embeddings across different domains. This was well before it became a norm. (Published at EACL-17)

Fellowships / Awards / Scholastic Accomplishments

- College's Dissertation Writing Fellowships (amongst 2 students in UMass CICS), Spring 2023.
- Data Science Common Good Fellowship (amongst 10 students in the UMass CICS), for Fall 2021.
- *Outstanding Inventive Spirit Award* for filing multiple patents by TCS Research, India.
- *Excellent Academic Performance* award (given to top out of 40) on the 3^{rd} Foundation Day of IIT Mandi.
- *Best Design Project*, (given to the top team out of 20) submitted under the *Design Practicum* course at IIT Mandi.
- *Summer Research Fellowship* by Indian Academy of Sciences, (given to top 2,000 students nationwide).
- *Contribution and Support Award* for 3 years (2011-2014) by *D*akshana foundation, an NGO in Edu. domain.
- *Merit-Cum-Means Scholarship* by Indian government, for the outstanding academic performance.
- Secured position in *top 1% amongst 4,25,000* (approx.) in the IIT-JEE 2010.
- Secured position in *top 0.5% amongst 10,00,000* (approx.) in the AIEEE 2010.
- Scholarship in junior school by Dakshana (NGO) (amongst *top 40* students out of all 660 schools nationwide).

Skills

Languages: Python, **Frameworks**: PyTorch, GPyTorch, AWS, GCP, **Tools**: MATLAB, Git, Latex