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# Mehrab Tanjim

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## SUMMARY

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**Research & Industry Experience:** 2-year experience on building state-of-the-art ML algorithms with scalable and data-driven techniques. 9-months of total industry experience.

**Programming Languages:** Python, Java, C/C++, Bash Script.

**Libraries/Services:** Pytorch/TensorFlow, Keras, Scikit-learn, Spark, Hadoop, AWS, Kubernetes, MATLAB.

## EDUCATION

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**PhD in CS – University of California, San Diego (UCSD)** *Sep. 2018 – Present*

- Coursework: Neural Networks/Pattern Recognition, Deep Learning for Sequences, Deep Unsupervised Learning, Computer Vision, Convex Optimization

**BS in CS – Bangladesh University of Engineering and Technology (BUET)** *Apr. 2012 – Feb. 2017*

- Coursework: Database, Operating System, Computer Networks, Software Development, Artificial Intelligence, Simulation and Modelling, Machine Learning, Pattern Recognition

## EXPERIENCE

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**Adobe, Inc.** **San Jose, USA**

*Computer Vision, Imaging & Video Intern* *June 2021 – Sep. 2021*

- **Debiasing Image-to-Image Translation:** Pretrained StyleGAN2 based networks show various biases in different image-to-image translation tasks (such as super-resolution, sketch-to-image, etc.). Mitigated this bias issue using contrastive learning and uniform sampling of minority attributes.

**Adobe, Inc.** **San Jose, USA**

*Data Science Intern* *June 2020 – Sep. 2020*

- **Bias Detection and Mitigation:** Identified the bias issue in the image results for search queries, proposed a way to audit. In addition, proposed an attribute-controlled style-based generator to create new content to mitigate such biases and enrich user experience [accepted in WACV'22].

**Etsy, Inc.** **New York, USA**

*Data Science Intern* *June 2019 – Sep. 2019*

- **Intent Detection for Recommendation:** Captured users' hidden intents (i.e. explore, purchase) from their interactions by designing a hierarchical Transformer model. It first discovers these intents and then pays attention to them for next item prediction (improved personalized recommendations by 5%) [Pdf].

**University of California, San Diego** **San Diego, USA**

*Graduate Student Researcher* *Sep. 2018 – Present*

- **Dynamic Convolution:** Built an adaptive convolution network which changes its kernel dynamically depending on the current input (~10% better recommendations, accepted in **CIKM 2020**) [Pdf] [Code].
- **Visual Commonsense Reasoning:** Enforced reasoning for ans. prediction on **VCR** by building a differentiable module which jointly trains ans. and rationale prediction (performed better in leaderboard) [Pdf] [Code].

- **CNN for Sequences:** Improved the scalability of sequential recommender methods by modelling a scalable depth-wise separable 1D convolution neural network (requires ~**30%** less memory) [\[Pdf\]](#).
- **Rationale Generation:** Tasked state-of-the-art Visual Question Answering model (ViLBERT) with rationale generation (using GPT-2) to interpret/justify answer prediction. It improves accuracy by **1.5%** as well [\[Pdf\]](#).

*Graduate Teaching Assistant*

*Sep. 2019 – Present*

- **Neural Networks/Pattern Recognition:** Designed and assessed assignments on DNN, CNN (Image Segmentations), and RNN/LSTM (Image Captioning). Responsible for mentoring deep learning projects.

**BUET**

**Dhaka, Bangladesh**

*Research Assistant*

*Oct. 2017 – Aug. 2018*

- **Scalable Machine Learning:** Improved the scalability of PCA for large datasets (up to **83x** better performance) using sketching technique [\[Pdf\]](#) [\[Code\]](#).
- **Distributed Algorithm Design/Federated Learning:** Extended both Spark and Hadoop for creating geo-distributed clusters in AWS and designed geo-distributed algorithms for higher dimension data [\[Code\]](#).

**Kona Software Lab.**

**Dhaka, Bangladesh**

*Junior Software Engineer Intern*

*Feb. 2017 – Apr. 2017*

- **Notification API Development:** Built real-time notification system using Retrofit API in for Android users.

## SELECTED PUBLICATIONS

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- **Md Mehrab Tanjim**, R. Sinha, K.K. Singh, S. Mahadevan, D. Arbour, M. Sinha, G.W. Cottrell, “Generating and Controlling Diversity in Image Search”, WACV 2022.
- T.M. Tariq Adnan, **Md Mehrab Tanjim** and Muhammad Abdullah Adnan, “Fast, Scalable and Geo-Distributed PCA for Big Data Analytics”, Elsevier Journal on Information Systems, 2021 [\[Pdf\]](#) [\[Code\]](#)
- **Md Mehrab Tanjim**, C. Su, E. Benjamin, D. Hu, L. Hong and J. McAuley, “Attentive Sequential Models of Latent Intent for Next Item Recommendation”, WWW 2020 [\[Pdf\]](#).
- **Md Mehrab Tanjim**, Hammad A. Ayyubi, Garrison W. Cottrell, “DynamicRec: A Dynamic Convolutional Network for Next Item Recommendation”, CIKM 2020 [\[Pdf\]](#) [\[Code\]](#).
- **Md Mehrab Tanjim** and Muhammad Abdullah Adnan, “sSketch: A Scalable Sketching Technique for PCA in the Cloud”, WSDM 2018 [\[Pdf\]](#) [\[Code\]](#).

## REFERENCE

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- **Dr. Garrison W. Cottrell**  
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