Ankur Arjun Mali

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I am a graduate student research specializing in machine learning with a focus in deep learning. My interest lies in developing learning algorithms, building neural models capable of lifelong learning, memory models, and state machine representation and extraction from recurrent neural networks.

Education

- **Pennsylvania State University** — **Pennsylvania, USA**
  Ph.D Informatics, — *2018-expected 2022*
  Advisor: **Dr. C Lee Giles**
  Co-Advisor: **Dr. Alexander G. Ororbia II**
- **Pennsylvania State University** — **Pennsylvania, USA**
  MS (Hons) Information Science and Technology , GPA:3.87 — *2016–2018*
  Advisor: **Dr. James Wang**
- **University of Pune** — **Pune, IN**
  B.E (Hons) Computer Engineering, First Class with Distinction — *2009–2013*
  Advisor: **Dr. Sudeep Thepade**

Publications

Anand Gopalakrishnan, **Ankur Mali**, Dan Kifer, C Lee Giles, and Alexander G. Ororbia. A Neural Temporal Model for Human Motion Prediction. *arXiv preprint arXiv:1809.03036*, 2018,(**CVPR 2019**).

Alexander G. Ororbia II* and **Ankur Mali***. Biologically Motivated Algorithms for Propagating Local Target Representations. *CoRR*, abs/1805.11703, 2018,**(In: Thirty-Third AAAI Conference on Artificial Intelligence. (Accepted Paper))**.

Alexander G. Ororbia II*, **Ankur Mali***, Matthew A. Kelly, and David Reitter. Like a Baby: Visually Situated Neural Language Models. *CoRR*, abs/1805.11546, 2018, **(ACL 2019)**.

Alexander G. Ororbia II, **Ankur Mali**, Daniel Kifer, and C. Lee Giles. Conducting Credit Assignment by Aligning Local Representations. *CoRR*, abs/1803.01834, 2018,(**Under Review**).

Alexander G. Ororbia II, **Ankur Mali***, Jian Wu, Scott O'Connell, David J. Miller, and C. Lee Giles. Learned Neural Iterative Decoding for Lossy Image Compression Systems. *CoRR*, abs/1803.05863, 2018,**(Data Compression Conference 2019)**.

Alexander Ororbia, **Ankur Mali**, Daniel Kifer, and C. Lee Giles. Lifelong neural predictive coding: Sparsity yields less forgetting when learning cumulatively. *CoRR*, abs/1905.10696, 2019,**Under Review**.

Alexander Ororbia*, **Ankur Mali***, C Lee Giles, and Daniel Kifer. Online Learning of Recurrent Neural Architectures by Locally Aligning Distributed Representations. *arXiv preprint arXiv:1810.07411*, 2018,**(Accepted into IEEE transaction on Neural Networks and Learning Systems)**.

SD Thepade, **Ankur Mali**, and K Subhedarpage. Content Based Video Retrieval using Thepade's Ternary Block Truncation Coding and Thepade's Sorted Ternary Block Truncation Coding with Various Color Spaces. *International Journal of Emerging Technologies in Computational and Applied Sciences*, 8(6):462–466, 2014.

Sudeep D. Thepade, Krishnasagar Subhedarpage, **Ankur Mali**, and Tushar S. Vaidya. Performance Gain of Content Based Video Retrieval Technique using Intermediate Block Truncation Coding on Different Color Spaces. *2013 International Conference on Communication and Signal Processing*, pages 1017–1020, 2013.

Sudeep D Thepade, Krishnasagar Subhedarpage, **Ankur Mali**, and Tushar S Vaidya. Color Content Based Video Retrieval using Block Truncation Coding with Different Color Spaces. *International Journal of Computer Applications*, 64(3), 2013.

Sudeep D Thepade, Krishnasagar Subhedarpage, **Ankur Mali**, and Tushar S Vaidya. Performance Augmentation of Video Retrieval using Even-Odd Videos with Multilevel Block Truncation Coding. *International Journal of Computer Applications*, 64(9), 2013.

Sudeep D Thepade, Krishnasagar S Subhedarpage, and **Ankur Mali**. Performance Rise in Content Based Video Retrieval using Multi-level Thepade's Sorted Ternary Block Truncation Coding with intermediate block videos and even-odd videos. In *Advances in Computing, Communications and Informatics , 2013 International Conference on*, pages 962–966. IEEE, 2013.

Previous Employment

- **Verisk Analytics** — **New Jersey, USA**
  Cognitive Analytics and Machine Learning Engineer — *May 2017–August 2017*
  Improved OCR detection results by 12% features from a very deep VGG19 convolution neural network (CNN) and a recurrent neural network with attention. Integrated the attention mechanism to improve recognition results by 7.9%.
- **Curiologic Technologies** — **Pune, IN**
  Algorithm Engineer, Team Lead — *Mar 2014– Jun 2016*
  Improved previous face recognition API performance by 32.6% with lowest error rate at 3.46%. Improved multiple face recognition and detection API performance by 16.79%. Developed script to preprocess image data and create one hot encodings to classify data with a CNN architecture.

Research Experience

- **The Pennsylvania State University, IIS Lab** — **Pennsylvania, USA**
  Graduate Research Assistant — *Jan 2018–Present*
  Working on biologically-plausible learning algorithms, memory-augmented networks for extracting state machines and optimization in machine learning. Working with Dr Lee Giles, Dr Daniel Kifer and Dr. Alexander G. Ororbia II.
- **High Performance Computing and Cyberinfrastructure Unit(PSU)** — **Pennsylvania, USA**
  Graduate Assistant — *Jan 2017–May 2017*
  Developed scripts to run program on a distributed environment with 1000 clusters and processors. Developed scripts to work specifically for group environment. Worked with R&D Engineer Chuck Pavloski.
- **The Pennsylvania State University, IIS Lab** — **Pennsylvania, USA**
  Research Assistant — *Sep 2016–Dec 2017*
  Worked on Medical Image Analysis using Deep Learning and statistical Models. Worked with Dr. James Wang
- **The Pennsylvania State University, Data Science(Pike) Group** — **Pennsylvania, USA**
  Research Assistant — *Sept 2016–Dec 2016*
  Crawled Facebook(FB) and Twitter data to extract 40 million users. Developed a novel method which was able to bypass Facebook API limitation. Analyzed 15k Instagram images and classified them into 2 classes based on visual and textual features. Worked with Dr. Dongwon Lee.
- **The Pennsylvania State University, Artificial Intelligence Lab** — **Pennsylvania, USA**
  Research Assistant — *Sep 2016–Dec 2016*
  Developed deep neural models for DNA/RNA sequence data. Worked on Bayesian and CNNs to analyze complex DNA/RNA sequences. Worked with Dr. Yasser El-Manzalawy

- **The Pennsylvania State University, Cognitive Science Lab** — **Pennsylvania, USA**
  Research Assistant — *Sep 2016– Dec 2017*

  Worked on developing cognitive language models for learning distributed representations of text. Developed a bidirectional recurrent network and an associative Long Short Term Memory (LSTM) model in TensorFlow. Worked with Dr. David Reitter.

- **Image Processing Research Group** — **Pune, IN**
  External Research Scholar (Associate) — *Jun 2013– Feb 2014*

  Developed new method Thepade's Sorted Ternary Block Truncation Coding(TSTBTC). Published 5 research papers in the domain of Computer Vision. Worked with Dr. Sudeep Thepade.

Teaching Experience

- **IST597:Foundations of Deep Learning** — **Pennsylvania, USA**
  Teaching Assistant — *Aug 2018–Current*

  Taught graduate students how to develop neural models in **TensorFlow** .Course also includes providing an hands-on training and developing deep neural networks.

- **Neural Compression Group, Penn State** — **Pennsylvania, USA**
  Technical Lead — *Jun 2017–Current*

  Technical lead in TensorFlow for neural compression group (on behalf of Dr. Lee Giles, in coordination with Dr. Jian Wu and Dr. Alex Ororbia). Mentored one undergrad and one master student.

- **IST 210: Organization of Database.** — **Pennsylvania, USA**
  Teaching Assistant — *Sep 2016–Dec 16*

  Coached and graded 48 undergrad students in MSSQL and PHP. Provided constructive feedback on assignments, projects and exams. Guided students in developing project ideas and helped them in developing unique projects.

Professional Activities and Awards

- **SubReviewer**: WWW 2019, Neural Computation 2019
- **Student Travel Grant:** Federated Logic Conference 2018, University of Oxford, UK.
- **Travel Grant:** ICRA 2016 (Top 4 finalist in HRATC 16), Sweden.
- **Nvidia GPU Grant:** Team successfully received Nvidia grant for ICRA 2016.
- **Content Based Video Retrieval(Talk):** Invited to give talk on content-based video retrieval using Matlab at PCCOE(University of Pune), 2014

Technical and Personal skills

- **Programming Languages:** Proficient in: C, C++, Python, Matlab, OpenCV, LaTeX
- **Robotics Framework:** Robot operating system (ROS).
- **Software/Frameworks:** Tensorflow, PyTorch.
- **Computer Vision API:** Microsoft Azure, Clarifai.

References

- **Dr. C. Lee Giles:** David Reese Professor, The Pennsylvania State University, University Park, PA Email: giles@ist.psu.edu.
- **Dr. Alexander G. Ororbia II:** Assistant Professor, Rochester Institute of Technology, New York Email: ago@cs.rit.edu.
- **Dr. Daniel Kifer:** Associate Professor, The Pennsylvania State University, University Park, PA Email: dkifer@cse.psu.edu