Deepak Gopinath

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Education

Carnegie Mellon University — Pittsburgh, PA
M.S., Language Technologies Institute, School of Computer Science — Aug 2015 – Dec 2016

Birla Institute of Technology and Science, Pilani — Pilani, India
B.S. in Computer Science — 2010 – 2014

Work Experience

Meta AI (Facebook AI Research) — Pittsburgh, PA
Research Engineer, AI for Creativity — July 2019 – current

- Exploratory research in modeling human motion with sequential models like transformers and animating physically simulated human characters using reinforcement learning (RL)
- Developed and open-sourced the fairmotion and ScaDiver libraries to enable human motion research and apply research to production (Habitat for Embodied AI research, Horizon Worlds virtual reality) [6]
- Published research at ACM SIGGRAPH [1] [4] [5], NeurIPS [3], and SIGGRAPH Asia [2] (under review)
- Skills: Python, PyTorch, TorchServe; RLLib for distributed RL training; PyBullet and Isaac Gym physics simulators; OpenGL, Blender, Unity for character/scene building, animation and rendering.

Software Engineer, Language and Translation Technologies — Jan 2017 – July 2019

- Co-developed and shipped the first neural machine translation (NMT) system to power translations for all user content on Facebook and Instagram (7B+ translations per day) [blogpost][press]
- Implemented various components of seq2seq models on Caffe2 and PyTorch, and developed workflows for end-to-end training, evaluation, and deployment of translation models
- Productionized models by leveraging monolingual data to enable translations in low resource language pairs. Deployed multilingual NMT systems to translate many languages with a single model [blogpost] [press]
- Skills: Python, PyTorch; ONNX, C++ for production code; Hive, Spark for data processing

Software Engineering Intern, Language Technology — May 2016 – Aug 2016

- Developed neural network language models on the (newly) open sourced deep learning framework Caffe2.0

LinkedIn — Bangalore, India
Software Engineer, Content Search — July 2014 – Aug 2015

- Developed the prefix query tagger library to predict autocompletions and tags for an incomplete query
- Co-implemented and deployed federated search and auto-complete search for several verticals on linkedin.com
- Developed a search diagnostic web app to fetch information from every component of the search engine
- Skills: Java, Lucene, Pig, Flex, Play Framework with JQuery and Bootstrap, JavaScript

Microsoft Research — Bangalore, India
Research Developer Intern, Applied Sciences — Jan 2014 – July 2014

- Fraud detection in Azure services and sentiment analysis of Azure users in social media
- Launched the Indian Elections Game web app, an interactive prediction market for the public to make predictions on the 2014 Indian Elections [blogpost]

Amazon — Bangalore, India
Machine Learning Intern — May 2013 – July 2013

- Adult content detection for Amazon Android AppStore using random forests, leading to a 30% load reduction for human reviewers
- Developed a system to cluster Amazon seller FAQs using Latent Dirichlet Allocation (LDA) and map customer queries to the clusters with logistic regression, SVMs, and supervised LDA

Mentorship

- Mentored or co-mentored 9 Research and SWE interns at Meta AI
- Supported 20+ new team members through their team on-boarding process at Meta AI and mentored 5 junior engineers in the internal technical mentorship program
- Actively involved in technical onboarding for new university grad hires and co-mentored 3 SWE interns

Awards and Honors

- Project Acyut: A team of 5 undergraduate students that built India's first indigenously developed autonomous humanoid robot. I designed and implemented all aspects of the computer vision and robot behavior modules [press coverage]
  - 3rd Prize at RoboCup 2011 in Autonomous Humanoid Team Soccer
  - 2 silver medals at RoboGames 2011, the (then) world's biggest open robotics event
- Placed 4th in ACM ICPC, Asia Regionals, Kharagpur site in December 2013
- Placed 2nd in Amazon Machine Learning HackEnd 2013 Kindle summary relevance challenge
- Winner of LinkedIn Bangalore HackDay 2015 for developing realtime viewer statistics aggregating system using NodeJS

Publications

[1] "Physics-based Character Controllers using Conditional VAEs" [webpage][pdf]
J. Won, **D. Gopinath**, and J. Hodgins
ACM Special Interest Group on Computer Graphics (SIGGRAPH), 2022.

[2] "Transformer Inertial Poser: Attention-based Real-time Human Motion Reconstruction from Sparse IMUs" [pdf]
Y. Jiang, Y. Ye, **D. Gopinath**, J. Won, A.W. Winkler, and C.K. Liu
ACM Special Interest Group on Computer Graphics Asia (SIGGRAPH Asia) (under review), 2022.

[3] "Leveraging Demonstrations with Latent Space Priors"
J. Gehring, **D. Gopinath**, J. Won, G. Synnaeve, A. Krause, and N. Usunier
Conference on Neural Information Processing Systems (NeurIPS) (under review), 2022.

[4] "Control Strategies for Physically Simulated Characters Performing Two-player Competitive Sports". [webpage][pdf]
J. Won, **D. Gopinath**, and J. Hodgins
ACM Special Interest Group on Computer Graphics (SIGGRAPH), 2021.

[5] "A Scalable Approach to Control Diverse Behaviors for Physically Simulated Characters" [webpage][pdf]
J. Won, **D. Gopinath**, and J. Hodgins
ACM Special Interest Group on Computer Graphics (SIGGRAPH), 2020.

[6] "fairmotion - Tools to load, process and visualize motion capture data" [code]
D. Gopinath and J. Won
GitHub, facebookresearch/fairmotion, 2020.

[7] "Harnessing Indirect Training Data for End-to-End Automatic Speech Translation: Tricks of the Trade" [pdf]
J. Pino, L. Puzon, J. Gu, X. Ma, A. D. McCarthy, and **D. Gopinath**
International Conference on Spoken Language Translation (IWSLT), 2019.

[8] "Deep Multimodal Fusion for Persuasiveness Prediction" [pdf]
B. Nojavanasghari*, **D. Gopinath***, J. Koushik*, T. Baltrušaitis, and L. P. Morency
ACM International Conference on Multimodal Interaction (ICMI), 2016.

Graduate Courses

10701 Machine Learning	10807 Topics in Deep Learning	10705 Intermediate Statistics
11777 Advanced Multimodal ML	11642 Search Engines	11641 ML for Text Mining
10605 ML for Large Datasets	11611 NLP	11513 Intro to Comp Systems