Adityakrishna Chivukula

Dept. of Computer Science and Information Systems
BITS Pilani, Hyderabad Campus
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EDUCATION

BITS Pilani, Hyderabad, India
B.E. (Honours), Computer Science. Discipline GPA: 8.13/10 — expected, July 2017

AECS Maaruti Magnolia Public School
Senior Secondary School, Science Stream. AISSE: 93.6% — expected, May 2013

PUBLICATIONS

On the Modeling of Error Functions as High Dimensional Landscapes for Weight Initialization in Learning Networks,
Julius, Gopinath Mahale, Sumana T., Adityakrishna Chivukula
In the proceedings of International Conference on Embedded Systems, Architecture, Modeling and Simulation (SAMOS XVI) [arXiv]

ACADEMIC PROJECTS

Deep Learning, Techniques and Applications — April 2016 - Present
Studying the various Deep Learning techniques including

- *Network Architecture:* CNN, RNN, LSTM, GAN, Autoencoders
- *Optimization:* Stochastic Gradient Descent, RMSprop, Adagrad and variants, second-order optimizations techniques.
- *Implementation:* Code primarily written in Tensorflow and run on standard datasets (CIFAR, ImageNet). Other libraries used were Caffe and Torch.

Augmented Reality using Deep Learning for Scene Understanding — April 2016 - Present
Design Deep Learning system for real-time semantic segmentation and labelling of key objects in view. Some of the papers that inspired this project are:

- *Learning to Segment Object Candidates*, Pinheiro et al.
- *Conditional Random Fields as Recurrent Neural Networks*, Zeng et al.

Automatic Differentiation — Jan 2016 - May 2016
Worked on implementing a simplistic operator overloading based reverse mode AD tool. Specifically, I implemented DAGs using a custom AD tool with composite functions represented as independant gates rather than a combination of basic operators. Studied multiple taping methods and DAG reductions.

Real-Time Rainfall Simulation in OpenGL — Aug 2015 - Dec 2015
Implemented a physics-based droplet rendering rainfall simulation based on the approach mentioned in the following paper:
Real-time Rain Simulation in Cartoon Style, Feng et al [GitHub]

RESEARCH INTERNSHIPS

CADLab, Indian Institute of Science, Bangalore — Dec 2015 - Mar 2016
Worked on a Statistical Physics formulation of the optimization objective for Neural Networks. Using results from Random Matrix Theory for Spin Glass Models, we define a weight initialisation that performs better than current initialisation methods on simple networks. Results published in SAMOS XVI.

TEACHING

Deep Learning Society Aug 2016 - Present

Conduct weekly discussion sessions on trending Deep Learning and their applications in practice. Topics include the mathematical formulation of a variety of networks and optimization objectives, methods of implementation and current research trends.

Teaching Assistant Aug 2015 - Dec 2015

CS F222, Discrete Sructures for Computer Science

- Designed coding assignment questions for evalutaion.
- Implemented portal for submitting and evaluating responses, hosted on the intranet.

SKILLS

- *Languages & Software:* (*in order of proficiency*)
  C++, Python, MATLAB/Octave, Java, R
- *Libraries:* Tensorflow, Caffe, Torch, OpenGL, CGAL, OpenCV.

EXTRA-CURRICULAR ACTIVITIES

Head of Editorial Board, BITS Embryo

BITS Embryo is a student body that invites renowned speakers, domain experts and successful alumni from around the world enagaged in a variety of domains to deliver guest lectures for the students of the university.

Volunteer, HelpAge India - Bangalore

HelpAge India is a nation-wide NGO that works towards assisting and improving the well-being of senior citizens.

REFERENCES

Prof. S.K.Nandy
Convener, CADLab
Dept. of Computational and Data Sciences
Indian Institute of Science, Bangalore