David Eigen de@deigen.net

EXPERIENCE

Research Scientist, Clarifai — 2015 – Present
Research Intern, Google Brain — 2013
PhD Student, New York University — 2010 – 2015
Software Engineer, Cisco IronPort Systems — 2007 – 2010
Software Engineer, NetApp — 2005 – 2007

EDUCATION

New York University, New York, NY — Ph.D. Computer Science, 2015
Thesis: "Predicting Images using Convolutional Networks: Visual Scene Understanding with Pixel Maps"
Brown University, Providence, RI — Sc.M. Computer Science, 2005
Brown University, Providence, RI — Sc.B. Mathematics - Computer Science, 2003

PAPERS & PUBLICATIONS

Efficient Training of Deep Convolutional Neural Networks by Augmentation in Embedding Space
Mohammad Saeed Abrishami, Amir Erfan Eshratifar, David Eigen, Yanzhi Wang, Shahin Nazarian and Massoud Pedram
ArXiv Preprint 2020

Finding Task-Relevant Features for Few-Shot Learning by Category Traversal
Hongyang Li, David Eigen, Samuel Dodge, Matthew Zeiler and Xiaogang Wang
CVPR 2019

A Meta-Learning Approach for Custom Model Training
Amir Erfan Eshratifar, Mohammad Saeed Abrishami, David Eigen and Massoud Pedram
AAAI Student Abstract Track 2019

Gradient Agreement as an Optimization Objective for Meta-Learning
Amir Erfan Eshratifar, David Eigen and Massoud Pedram
NeurIPS Meta-Learning Workshop 2018

Predicting Depth, Surface Normals and Semantic Labels with a Common Multi-Scale Convolutional Architecture
David Eigen and Rob Fergus
ICCV 2015

Unsupervised Learning of Spatiotemporally Coherent Metrics
Ross Goroshin, Joan Bruna, Jonathan Tompson, David Eigen and Yann LeCun
ICCV 2015

End-to-End Integration of a Convolutional Network, Deformable Parts Model and Non-Maximum Suppression
Li Wan, David Eigen and Rob Fergus
CVPR 2015

Depth Map Prediction from a Single Image using a Multi-Scale Deep Network
David Eigen, Christian Puhrsch and Rob Fergus
NIPS 2014

OverFeat: Integrated Recognition, Localization and Detection using Convolutional Networks
Pierre Sermanet, David Eigen, Xiang Zhang, Michael Mathieu, Rob Fergus and Yann LeCun
ICLR 2014

Learning Factored Representations in a Deep Mixture of Experts
David Eigen, Marc'Aurelio Ranzato and Ilya Sutskever
ICLR Workshops 2014

Understanding Deep Architectures using a Recursive Convolutional Network
David Eigen, Jason Rolfe, Rob Fergus and Yann LeCun
ICLR Workshops 2014

Restoring An Image Taken Through a Window Covered with Dirt or Rain
David Eigen, Dilip Krishnan and Rob Fergus
ICCV 2013

Nonparametric Image Parsing using Adaptive Neighbor Sets
David Eigen and Rob Fergus
CVPR 2012

SELECTED PROJECTS

Inference Model Scaling, at Clarifai, 2020
Developed system to automatically scale model deployments in a cloud environment based on inference request load. Can load and scale up neural network models from zero on demand to handle both unexpected bursts and slowly adapting traffic, and efficiently share GPUs between models.

Deep Training and Deployment in Cloud Environments, at Clarifai, 2018-20
Led project to integrate our training and experimentation system with our data platform to create object detection and classification models in multiple cluster environments. Handles data validation, model training, evaluation, and inference deployment. Defined benchmarks to measure accuracy and speed for different types of models, and found best price/performance points.

Object Detection for Aerial Video, at Clarifai, 2017-19
Object detector for near-realtime detection on aerial videos in a government contract. Led ML team and developed improvements to detection methods, data cleaning, and measurement, resulting in significant performance gains. Top-performing system in comparison to other contract competitors.

Few-Shot Learning Research Projects, at Clarifai, 2017-18
Mentored interns on projects in few-shot learning. Published works at CVPR 2019 and NeurIPS Meta-Learning Workshop 2018.

Object Detection Neural Network and Framework, at Clarifai, 2016-18
Wrote object detection code framework for use with in-house neural network library and tensorflow. Created object detection models performing at state-of-the-art accuracy and ~1.5x faster compared to concurrently developed opensource object detectors.

Experiment and Training Infrastructure, at Clarifai, 2016-18
Built job scheduler and experiment tracking system targeted for ML model building, comparison and change tracking for reproducibility.

Fast Image Classifier Training, at Clarifai, 2015-17
Developed fast classifier training system used by end customers and internal company teams to quickly build many classifiers in diverse applications. Included work on frozen classifier embeddings, quantization, data balancing, and neural network architecture. Developed benchmarks based on first customers' uses in beta deployments to rework key components for general release.

Logo Recognition from Synthetic Data, at Clarifai, 2016
Built a system to train detection models to recognize logos in images based on synthetic data.

Face Detection and Recognition, at Clarifai, 2016-17
Created industry-competitive face detection and recognition system. Initial labeling for the detector based on combinations of open-source detectors with data filtering, and refined with hard example mining.

Image Content Moderation using Weak Labels, at Clarifai, 2015
Created industry-leading classifier for image-based content moderation and filtering, using target labels created automatically from a word-based classifier applied to weak labels and user-supplied text.

Depth, Surface Normals and Semantic Labels Prediction from a Single Image, at NYU, 2013-15
Predicts depth, surface normals and semantic segmentation from a single image using a multi-scale convolutional network. Published works at NIPS 2014, ICCV 2015.

OverFeat: ImageNet Classification, Localization and Detection, at NYU, 2013
Object localization and detection system; only system to enter in all three ImageNet 2013 challenge tasks (classification, localization and detection). Published work at ICLR 2013.

Sender IP Reputation from Spam Trap Rates, at IronPort/Cisco, 2010
Created a system to classify IP addresses as likely spam senders for email, using live streams of spam trap hits and overall mail volume estimates.

Automated Web Content Classifier. at IronPort/Cisco, 2009
Created a system to automatically classify web page content into 30 categories, based on Naive Bayes classification methods. Used to categorized over 10 million sites.

Web Reputation, Telemetry and Corpus, at IronPort/Cisco, 2007 - 2009
Datasource aggregator to score HTTP requests according to the chance of malicious content. Used on web proxy devices to block potentially malicious requests. Automatically fed back traffic samples from deployments to improve accuracy and coverage.

NVLog Parallelization, at NetApp, 2007
Rewrote filesystem journal writes to nearly eliminate lock contention, leading to over 10% higher throughput in file server workloads.

Visualization for Differential Geometry, as RA with Prof. Banchoff, Brown Univ., 2000-2004
Created a software package for creating interactive differential geometry visualizations, and produced class labs and demonstrations using this software.