

David Eigen

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## EXPERIENCE

Research Scientist/Engineer, Clarifai — 2015 – 2025

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

## PUBLICATION HIGHLIGHTS (FULL LIST: [GOOGLE SCHOLAR PAGE](#))

### **Progressive Checkboards for Autoregressive Multiscale Image Generation**

David Eigen. ArXiv Preprint 2026

### **Finding Task-Relevant Features for Few-Shot Learning by Category Traversal**

Hongyang Li, David Eigen, Samuel Dodge, Matthew Zeiler and Xiaogang Wang. CVPR 2019

### **Predicting Depth, Surface Normals and Semantic Labels with a Common Multi-Scale Convolutional Architecture**

David Eigen and Rob Fergus. ICCV 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

## PROJECT HIGHLIGHTS

### **LLM & Model Inference Orchestration**, at Clarifai, 2020-25

System for production inference and model scaling on demand. Handles millions of requests / billions of tokens daily. Adapts to bursts and slowly adapting traffic, scales and shares GPUs between models for lowest cost. Cross-network protocols allow workers to run in multiple clouds to use lowest-cost GPU hardware providers behind a single API. Achieves best-in-class price, latency and throughput.

### **Object Detection for Aerial Video**, at Clarifai, 2017-20

Object detector for realtime detection on aerial videos. Led ML team and developed improvements to detection methods, data cleaning, measurement and iteration. Top-performing system in federal contracts over multiple years.

### **Interactive Image Model Training**, at Clarifai, 2015-17

Developed fast classifier training used by customers and internal teams to quickly build many classifiers in diverse applications. Includes embeddings, quantization, data balancing, and network architecture. Benchmarked and improved based on customers' uses in deployments for improvements.

**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.

**Automated Web Content Classifier**, at IronPort/Cisco, 2009

Created a system to automatically classify web page content into categories.

**NVLog Filesystem Journal**, at NetApp, 2007

Rewrote filesystem journal to eliminate lock contention, leading to over 10% higher total system throughput.

**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.

**Paper Reviewer**, 2013 - present

Official submission reviewer for NeurIPS, ICLR, TMLR, annually; other conferences and journals on occasion.

**ADDITIONAL PROJECTS**

**Video Inference Pipeline Engine**, at Clarifai, 2025

Simple and fast video pipeline engine in python, supporting real-time multi-stage inference applications (e.g. detect and track). Adaptive rate limiting, parallel execution and pipelining in small, easily importable python package.

**Model Deployment Encapsulation**, at Clarifai, 2023-24

Designed and led model encapsulation, including input/output formats, dependency installs and runtime resource estimates. Models can be shipped between clusters, including air-gapped, without being tied to container base images.

**Model Deployment Scaling**, at Clarifai, 2020-23

Developed system to scale model deployments based on inference request load. Can scale models from zero on demand to handle both unexpected bursts and slowly adapting traffic, and efficiently shares GPUs between models.

**Model Training API**, at Clarifai, 2018-23

Led project to integrate training and experimentation system with data platform to create detection and classification models in multiple cluster environments. Handles data validation, model training, evaluation, and inference deployment. Defined benchmarks to measure accuracy and speed, and found best price/performance points.

**Estimating Camera FOV, Pitch and Roll from a Single Image**, at Clarifai, 2021

Developed prototype method to estimate camera field of view, pitch and roll from single image. Located and assembled initial datasets and models, simplified and improved models adding normalized angle regression and NLL loss. Combined FOV with horizon estimates to find pitch with its estimated certainty.

**Video Object Detection Streaming Engine**, at Clarifai, 2020-21

Wrote core execution engine for video object detection and tracking: frame buffer, parallel inference, serialized tracker and completion, and interface with custom video streaming protocols used by customer.

**Few-Shot Learning Research Projects**, at Clarifai, 2017-19

Mentored interns on projects in few-shot learning. Published at CVPR 2019 and NeurIPS Meta-Learning Workshop 2018.

**Object Detection 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 concurrent open-source detectors.

**Experiment and Training Infrastructure**, at Clarifai, 2016-18

Built job scheduler and tracking system for ML model building, comparison and change tracking for reproducibility.

**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.

**Sender IP Reputation from Spam Trap Rates**, at IronPort/Cisco, 2010

Classifies IP addresses as email spam senders, using live streams of spam trap hits and overall mail volume estimates.

**Web Reputation, Telemetry and Corpus**, at IronPort/Cisco, 2007 - 2009

Datasource aggregator to score HTTP requests according to the chance of malicious content. Automatically fed back traffic samples from deployments to improve accuracy and coverage.

## ALL PUBLICATIONS

**Progressive Checkerboards for Autoregressive Multiscale Image Generation**

David Eigen. ArXiv Preprint 2026

**Enhancing Worldwide Image Geolocation by Ensembling Satellite-Based Ground-Level Attribute Predictors**

Michael J Bianco, David Eigen, Michael Gormish. WACV Geospatial Workshop 2024

**Deep learning in medical image analysis: introduction to underlying principles and reviewer guide using diagnostic case studies in paediatrics**

Constance Dubois, David Eigen, Emmanuel Delmas, Margot Einfalt, Clara Lemaçon, Laureline Berteloot, Patrick M Bossuyt, David Drummond, Pauline Scherdel, François Simon, Héloïse Torchin, Yasaman Vali, Isabelle Bloch and Jérémie F Cohen. bmj 2024

**Development and validation of a smartphone-based deep-learning-enabled system to detect middle-ear conditions in otoscopic images**

Constance Dubois, David Eigen, François Simon, Vincent Couloigner, Michael Gormish, Martin Chalumeau, Laurent Schmoll and Jérémie F. Cohen. npj Digital Medicine 2024

**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. ISQED 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 Abstracts 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

**PATENTS**

**Prediction-model-based mapping and/or search using a multi-data-type vector space**

M Zeiler, D Eigen, R Compton, C Fox. US Patent 11281962 (2022)

**System and method for facilitating graphic-recognition training of a recognition model**

D Eigen, M Zeiler. US Patents 10163043 (2018), 10776675 (2020), 11417130 (2022)

**System, method and computer-accessible medium for restoring an image taken through a window**

R Fergus, D Eigen, D Krishnan. US Patents 9672601 (2016), 9373160 (2017)

**Method and apparatus for generating dynamic microcores**

D Eigen, D Grunwald. US Patent 7783932 (2010)