

Eric Kim

248 Guerrero Street, Apt 202 • San Francisco, CA 94103 •

805-300-9474

<http://www.eric-kim.net>

eric.kim.cs@gmail.com

RESEARCH INTERESTS

Computer vision, machine learning, medical imaging. Specific applications: object detection, face recognition, tissue segmentation, visual modeling, and 3D reconstruction.

EDUCATION

University of California, Los Angeles

Computer Science, M.S. (09/2013 – 06/2016)

Advisors: Professor Demetri Terzopoulos, Dr. M. Alex O. Vasilescu (Tensor Vision Technologies)

Thesis: “A Part-Based, Multiresolution, TensorFaces Approach to Image-Based Facial Verification”

University of California, Berkeley

Computer Science, B.A. (08/2007 – 12/2011)

PUBLICATIONS

“Three-dimensional soft tissue analysis of the face following micro-implant-supported maxillary skeletal expansion,” Sara Abedini, Islam Elkenawy, Eric Kim, Won Moon. *Progress in Orthodontics*, 2018. (*Accepted, publication pending*)

Developed a statistical model of shape and appearance to perform bone contour segmentation of 3D medical imaging data. Enhanced accuracy of the model by extending the appearance model and the search algorithm to work well on 3D data. After achieving mesh correspondence via a nonrigid iterative closest point registration algorithm, ran statistical tests on pre/post operation facial structure data to determine statistically significant regions of change.

“Improved Support for Machine-Assisted Ballot-Level Audits,” Eric Kim, Nicholas Carlini, Andrew Chang, George Yiu, Kai Wang, David Wagner. *EVT/WOTE 2013*, August 2013.

Presented improvements to the OpenCount system, which significantly reduce operator effort. Our new techniques yield order-of-magnitude speedups compared to the previous system, and enable us to successfully process elections that would not have reasonably feasible without these improvements.

“Operator-Assisted Tabulation of Optical Scan Ballots,” Kai Wang, Eric Kim, Nicholas Carlini, Ivan Motyashov, Daniel Nguyen, David Wagner. *EVT/WOTE 2012*, August 2012.

Designed and developed the OpenCount software, which allows an operator to efficiently create vote tallies of scanned voted ballots from an election. This is accomplished via a system that interleaves computer vision algorithms and operator assistance to achieve perfect (or near-perfect) accuracy. Successfully applied the tool on several California pilot audits in 2011.

“An Analysis of Write-in Marks on Optical Scan Ballots,” Theron Ji, Eric Kim, Raji Srikantan, Alan Tsai, Arel Cordero, and David Wagner. *EVT/WOTE 2011*, August 2011.

Developed a system to achieve automatic recognition of write-in marks on marked voter ballots. Evaluated the system on a large-scale election in Leon County, Florida, and studied the kinds of write-in marks that are seen in practice.

POSTERS

“OpenCount: Operator-Assisted Tabulation of Optical Scan Ballots”, Eric Kim, Nicholas Carlini, Andrew Chang, George Yiu, Zongheng Yang, Kai Wang, David Wagner. *NIST Future of Voting Systems Symposium*, February 2013.

EXPERIENCE

Software Engineer

Pinterest, Inc.

January 2017 – Present

Discovery (Visual Search)

As lead of the object detection group, I apply the state of the art in computer vision to extract a rich visual understanding of Pins. Implemented and launched a product feature “Lens your Look” that unifies text search with visual search to recommend outfits, and wrote a [blog post](#) describing the technical work. Designed and implemented a scalable, efficient Spark feature extraction pipeline that extracts visual signals on the billions of Pinterest images within hours.

Graduate Researcher

University of California, Los Angeles

Tensor Vision Technologies

September 2014 – June 2016

Department of Computer Science

Developed a novel facial verification system. By analyzing faces in a multiresolution, part-based multilinear framework, we improved verification results by 13% on the “Labeled Faces in the Wild” dataset relative to a previous multilinear approach (79% overall).

This work matured into my MS thesis, titled: “A Part-Based, Multiresolution, TensorFaces Approach to Image-Based Facial Verification”. Advisors: Professor Demetri Terzopoulos (UCLA), Dr. M. Alex O. Vasilescu (Tensor Vision Technologies).

Research Programmer

University of California, Los Angeles

Developed a statistical model of shape and appearance to perform bone contour segmentation of 3D medical imaging data. Enhanced accuracy of the model by extending the appearance model and the search algorithm to work well on 3D data. This work led to a publication.

January 2016 – December 2016

School of Dentistry

Research Engineer

Research Assistant

University of California, Berkeley

Designed and developed the election auditing software “OpenCount”. Involved the use of computer vision and image processing techniques: image registration, digit recognition, automatic visual barcode decoding, and “human-in-the-loop” processing for efficient data entry. Successfully performed several pilot audit programs in several California counties.

January 2012 – August 2013

August 2010 – January 2012

Department of Computer Science

TEACHING EXPERIENCE

Teaching Assistant (CS 61A)

Teaching Assistant (CS 61A)

Teaching Assistant (CS 3L)

Teaching Assistant (CS 61A)

Teaching Assistant (CS 61A)

Teaching Assistant (CS 61BL)

University of California, Berkeley

Teaching Assistant (CS 33)

Teaching Assistant (PIC 10A)

Teaching Assistant (PIC 10A)

University of California, Los Angeles

Taught several undergraduate computer science courses. Duties included holding weekly sections, writing and grading exams, holding office hours, and developing course material. [Additional teaching details here.](#)

May 2012 – August 2012

August 2011 – December 2011

May 2011 – August 2011

January 2011 – May 2011

August 2010 – December 2010

May 2010 – August 2010

Department of Computer Science

April 2015 – June 2015

January 2016 – March 2016

March 2016 – June 2016

Department of Computer Science

PROJECTS

- **FourVoices**: An automatic music generator. Using principles of music theory, I transformed the music generation problem into a set of constraints and variables, which I solve with a general-purpose constraint satisfaction solver. Hosted on GitHub, the project features a wiki and tutorials on usage. (Python)
- **Handwriting recognition**: Utilized adaptive splines to recognize handwritten characters. To recognize a handwritten character, a deformable spline model is fit to the character via an iterative deformation algorithm. The algorithm outputs a deformation cost which is used for recognition: the label of the spline model with smallest cost is declared the output label. (Matlab)
- Efficient barcode decoder for the Interleaved 2-of-5 format. (Python, OpenCV)
- Wrote a popular tutorial to kernel methods as used in machine learning: “*Everything You Wanted to Know about the Kernel Trick (But Were Too Afraid to Ask)*”.

KEY SKILLS

Technical Skills

Programming Languages: Python, C/C++, Matlab, Java, Scala, Javascript, HTML, CSS, php, Scheme, Assembly (MIPS, x86.64)

Specializations: Deep learning, computer vision, object detection, image classification, face recognition, medical imaging, machine learning, nonlinear optimization, automatic landmark detection, data analysis.

Libraries: Caffe, Caffe2, Tensorflow, pytorch, OpenCV, numpy, scipy, Spark

Productivity: Version control (svn, git, mercurial), UNIX toolset, LaTeX

GRADUATE COURSEWORK

Machine Perception

Reasoning with Partial Beliefs

Linear Programming
Large Scale Optimization
Visual Modeling

Convex Optimization
Applied Probability

UNDERGRADUATE COURSEWORK

Algorithms

Machine Structures

Machine Learning

Linear Algebra

Discrete Math

Operating Systems

Compilers

Computer Networks

Data Structures

Artificial Intelligence

Computer Security

Computer Graphics