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# VIGNESH JAGADEESH

## Profile

CV/ML researcher with extensive experience in designing core technologies, and leading machine learning projects cross functionally in large companies, start ups, and academia. Hands on team player striving for excellence in achieving targets.

## Experience

Research Manager, Apple Inc. 2016-Current

Responsible for managing research efforts in Camera & Photos on scene analysis. Successfully led cross functional efforts for high visibility features, cutting across data / training infrastructures, deep learning algorithm design, and field benchmarks.

Computer Vision Researcher, Apple Inc. 10/2014-Current

Technical Lead and core member of the team that shipped on-device mobile deep learning for face & scene analysis. These algorithms power Memories, and intelligent search capabilities in the Photos app on iOS and OS-X. Designed and tuned vision algorithms that are part of the popular Portraits feature on the iPhone 7 plus camera.

Research Scientist – 2, eBay Research Labs 02/2014-10/2014

Actively involved in [deploying visual search and recommendation engines](#) through the eBay Fashion App. Won the highly selective critical talent award for designing algorithms for visual recommendation. Leading the human parsing project, and project on deep learning for visual commerce.

Research Scientist – 1, eBay Research Labs 04/2013-01/2014

Leading projects on human pose estimation, data driven single image depth recovery, and fashion preference analysis from RGB-D feeds. Mentored projects on fine-grained categorization using a combination of image and textual cues, large-scale image search using geometric VLAD, and text recognition in the wild.

Research Assistant, Vision Research Lab, UCSB 08/2008-03/2013

Involved in the retinal connectome project. Challenges involved processing [16TB of image data on distributed computing platforms](#), and designing efficient tracking/tracing algorithms along with scalable attribute based detectors. Extensively

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collaborated on projects relating to distributed camera networks, saliency detection from human visual attention, and image search.

Research Intern, eBay Research Labs 06/2012-09/2012

Lead efforts in designing a visual recommendation engine for fashion inventory. Curated large scale visual fashion datasets for data driven co-occurrence model estimation. Investigated classification of clothing patterns using texture descriptors.

Research Intern, Mayachitra Inc. 06/2011-09/2011

Investigated the usage of efficient graph based techniques for scalable streaming video segmentation. Developed an efficient technique using watersheds for simultaneous segmentation of multiple touching structures in bio-microscopic imagery.

Research Intern, True Vision 3D Surgical 06/2010-09/2010

Implemented camera calibration using specially designed targets for photogrammetry in surgical videos. Designed matched filtering techniques for accurately detecting calibration target.

Research Intern, True Vision 3D Surgical 06/2008-09/2008

Designed auto-gain control for a stereoscopic camera using embedded programming, under resource constrained settings. Designed algorithms for efficient visual tracking in surgical video.

## Education

University of California, Santa Barbara - PhD in ECE, 2013

University of California, Santa Barbara - MS in ECE, 2009

Anna University, India - BS in ECE, 2007

## Skills

*Programming Skills:* C, C++, Python, Matlab, Javascript, jQuery, HTML, JAVA

*Libraries:* Boost, Opencv, PCL, CUDA

## Publications [Citations - 340]

<https://scholar.google.co.in/citations?user=tNdHr4MAAAAJ&hl=en>

1. B. Zhou, V. Jagadeesh, R.Piramuthu, ConceptLearner: Discovering Visual Concepts from Weakly Labeled Image Collections, CVPR 2015
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2. V Jagadeesh, R Piramuthu, A Bhardwaj, W Di, N Sundaresan, Large Scale Visual Recommendations from Street Fashion Images, KDD 2014
  3. R Pandey, A Bhardwaj, W Di, V Jagadeesh, R Piramuthu, Cascaded Sparse Color-Localized Matching For Logo Retrieval, ICIP 2014
  4. W Di, A Bhardwaj, V Jagadeesh, R Piramuthu, E Churchill, When relevance is not Enough: Promoting Visual Attractiveness for Fashion E-commerce, arXiv preprint arXiv:1406.3561
  5. A Bhardwaj, V Jagadeesh, W Di, R Piramuthu, E Churchill, Enhancing Visual Fashion Recommendations with Users in the Loop, arXiv preprint arXiv: 1405.4013
  6. Z Wang, W Di, A Bhardwaj, V Jagadeesh, R Piramuthu, Geometric VLAD for Large Scale Image Search, ICML Workshops 2014
  7. Chen -Yu Lee, Anurag Bhardwaj, Wei Di, Vignesh Jagadeesh, Robinson Piramuthu, Region-based Discriminative Feature Pooling for Scene Text Recognition, CVPR 2014
  8. Vcente Ordonez, Vignesh Jagadeesh, Wei Di, Anurag Bhardwaj, Robinson Piramuthu, Furniture-Geek: Understanding Fine-Grained Furniture Attributes from Freely Associated Text and Tags, WACV 2014
  9. Mohammad Haris Baig, Vignesh Jagadeesh, Robinson Piramuthu, Anurag Bhardwaj, Wei Di, Neel Sundaresan, Im2Depth: Scalable Exemplar Based Depth Transfer, WACV 2014
  10. Karthikeyan S, Vignesh Jagadeesh, Renuka Shenoy, Miguel Eckstein, B.S. Manjunath, From Where and How to What We See, ICCV 2013
  11. Jiejun Xu, Vignesh Jagadeesh, Zefeng Ni, Santhosh KumarSunderrajan, B.S. Manjunath, Graph-based Topic-focused Retrieval in Distributed Camera Network, IEEE Transactions on Multimedia 2013
  12. Jiejun Xu, Vignesh Jagadeesh, B.S. Manjunath, Multi-label Learning with Fused Multimodal Bi-relational Graph, IEEE Transactions on Multimedia 2013
  13. Vignesh Jagadeesh, James Anderson, Bryan Jones, Robert Marc, Steven Fisher, B.S. Manjunath, Robust Segmentation based Tracing using an Adaptive Wrapper for Inducing Priors, IEEE Transactions on Image Processing 2013
  14. Nhat Vu, Vignesh Jagadeesh, B.S. Manjunath, "Multilabel MRFs with Label Adjacency Constraint: Globally Optimal Solutions and Applications", VRL Technical Report
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15. Vignesh Jagadeesh, James Anderson, Bryan Jones, Robert Marc, Steven Fisher, B.S. Manjunath, Synapse Classification and Localization in Electron Micrographs, Pattern Recognition Letters 2013
  16. Karthikeyan S, Vignesh Jagadeesh, B.S. Manjunath, Learning bottom up text attention maps for text detection using stroke width transform, ICIP 2013
  17. Karthikeyan S, Vignesh Jagadeesh, B.S. Manjunath, Learning top down scene context for visual attention modeling in natural images, ICIP 2013
  18. Vignesh Jagadeesh, Min Chi Shih, B.S. Manjunath, K. Rose, "Scalable Tracing of Electron Micrographs by Fusing Top Down and Bottom Up Cues using Hypergraph Diffusion", MICCAI 2012
  19. Vignesh Jagadeesh, Bangalore S. Manjunath, James Anderson, Bryan Jones, Robert Marc, Steven Fisher: Online Parameter Estimation in Dynamic Markov Random Fields for Image Sequence Analysis, ICIP 2012
  20. Diana Delibaltov, Karthikeyan S.V., Vignesh Jagadeesh, B.S. Manjunath, "Robust Biological Image Sequences Analysis using Graph based Approaches", Asilomar Conference on Biological Image Analysis and Microscopy 2012
  21. Vignesh Jagadeesh, Nhat Vu and Bangalore S. Manjunath: Multiple Structure Tracing in 3D Electron Micrographs, MICCAI 2011
  22. Vignesh Jagadeesh, S.V. Karthikeyan and Bangalore S. Manjunath: Spatio-Temporal Optical Flow Statistics (STOFS) for Activity Classification, ICVGIP 2010
  23. Vignesh Jagadeesh and Bangalore S. Manjunath: Interactive Graph Cut Segmentation of Touching Neuronal Structures from Electron Micrographs, ICIP 2010
  24. Santhosh Kumar, Vignesh Jagadeesh, S Rahul, N. Venkateswaran: A fast time scale genetic algorithm based image segmentation using cellular neural networks (CNN), ICSPC 2007

## Patents

1. System and Method for Providing Fashion Recommendations, U.S. Patent Application Serial No.: 61/811,423vi
  2. System and Method for Scene Text Recognition in the Wild, U.S. Patent Application Serial No.: 61/874,291
  3. System and Method to Understand Items for Home Décor from Freely Associated Text and Tags, U.S. Patent Application Serial No.: 61/874,296
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4. System and Method for Estimating Depth from a Single Image for Shipping and Image Browsing, U.S. Patent Application Serial No.: 61/874,096
  5. Geometric VLAD based efficient Large Scale Image Retrieval & System, United States Application Serial No. NA
  6. Modellt – The story of little black dress: This contains how we model estimation of sale probability based on format used to display clothing items, United States Application Serial No. NA
  7. Inferring user tastes through observations for navigating fashion stores, United States Application Serial No. NA
  8. Discovering Visual Concepts from Weakly Labelled Image Collections, United States Application Serial No. NA
  9. Hierarchical Deep Convolutional Neural Network for Image Classification, United States Application Serial No. NA

### **Patents Substantially Contributed To:**

1. Real-time Surgical Reference Indicum Apparatus and Methods for Surgical Application United States Application Serial No. 12/249,845
2. Real-Time Surgical Reference Indicum Apparatus and Methods for Intraocular Lens Implantation, United States Application Serial No. 12/390,388
3. Real-Time Surgical Reference Indicum Apparatus and Methods for Astigmatism Correction, United States Application Serial No. 12/582,671

### **Program Committee Member**

1. Web-Scale Classification: Classifying Big Data from the Web, [http://lshtc.iit.demokritos.gr/WSDM\\_WS/CFP](http://lshtc.iit.demokritos.gr/WSDM_WS/CFP)
2. ICML 2014 workshop on New Learning Frameworks and Models for Big Data, [http://ama.liglab.fr/nlfmbd\\_icml14/index.html](http://ama.liglab.fr/nlfmbd_icml14/index.html)
3. IEEE BigData 2013 <http://cci.drexel.edu/bigdata/bigdata2013/callforpaper.htm>
4. 1<sup>st</sup> International Workshop on Large Scale Visual Commerce, <http://labs.ebay.com/lsviscom2013/>

### **Awards**

- MICCAI Student Travel Award, 2011
  - University Senate Travel Grant, 2010
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- CVPR Student Travel Award, 2010

## Reviewer

- BMC Bioinformatics
- Winter Applications of Computer Vision
- Neuroinformatics
- Journal of Electronic Imaging
- International Conference on Image Processing
- International Conference on Computational Biology

## Invited Lectures

- Image Segmentation: Level Set Methods and Graph Cuts, “Advanced Graduate Lectures in Computer Vision”, UCSB ECE, Spring 2012
- Image Segmentation: Visual Tracking and Level Sets, “Advanced Graduate Lectures in Image Processing”, UCSB ECE, Winter 2011

## Press Coverage

- <http://lonelybrand.com/blog/ebay-fashion-app-lets-users-search-by-image-swatch/>
- <http://www.prweb.com/releases/2013/4/prweb10599361.htm>
- <http://www.prweb.com/releases/2011/01/prweb4940244.htm>
- <http://www.frequency.com/video/toric-iol-alignment-using-rc-toolset/87818418>
- <http://www.trademarkia.com/rc-toolset-77966321.html>

## Mentoring

- Kota Hara, Univeristy of Maryland College Park
  - Kevin Shih, University of Illinois Urbana Champaign
  - Qiaosong Wang, University of Delaware
  - Aaron Yu, University of Texas at Austin
  - Mohammad Haris Baig, Dartmouth College
  - Vicente Ordonez Oman, UNC, Chapel Hill
  - Mark Mata, Cal State San Berdino
  - Cindy Tian, UCSB, ECE
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