

# Ragav Venkatesan

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PROFILE      Applied Scientist II at Alexa AI focused on emerging machine learning technologies. Areas of recent research interests include:

- Neural Network Compression.
- [Domain Adaptation](#).
- [Multiple-instance learning](#).

PROFESSIONAL EXPERIENCE      (P1) Amazon

(A1) <i>Applied Scientist II - Amazon Alexa AI</i>	November 2019 – Present
(A2) <i>Applied Scientist II - Amazon Web Services, AI Labs</i>	May 2019 – November 2019
(A3) <i>Research Scientist - Amazon Web Services, Sagemaker</i>	November 2017 – May 2019

*Statistics of Tenure:*

- Patents filed: 3.
- Peer-reviewed publications : 1.

*External Artifacts:*

- [Amazon SageMaker Reinforcement Learning](#).
- [Amazon SageMaker Object Detection Algorithms](#).
- [Amazon SageMaker Semantic Segmentation Algorithms](#).
- [Bring your own Tensorflow and MXNet models to Amazon SageMaker](#).
- [Neural Network Compression using AWS SageMaker Reinforcement Learning](#).

*Teaching:*

- Amazon A9 CVC workshop on AWS Sagemaker. February 2019
- Convolutional Neural Networks at Machine Learning University. 2019 – 2018
- Deep Neural Network Bootcamp. 2018

(P2) *Research Assistant - Arizona State University*. August 2011 – October 2017

(P3) *Computer Vision Research Intern - Intel Corp.* December 2013 – August 2014

- Built vehicle and lane detection for automated driver assistance systems applications.

EDUCATION      **Doctor of Philosophy** - Computer Science      October 2017  
Advisor: [Professor Baoxin Li](#)  
Arizona State University, Tempe, Arizona, USA

- [The Diabetic Retinopathy project](#)      Funding Agency: National Institutes of Health.
- [The MIDAS project](#)      Funding Agency: National Science Foundation.

**Master of Science** - Electrical Engineering      August 2012  
Advisor: [Professor David Frakes](#)  
Arizona State University, Tempe, Arizona, USA

**Bachelor of Engineering** - Electronics and Communication Engineering      June 2010  
Anna University, Chennai, Tamil Nadu, India

- BOOKS (B1) **Ragav Venkatesan**, Baoxin Li, “ **Convolutional Neural Networks in Visual Computing: A Concise Guide** ”, CRC Press, a Tyler & Francis company, 2017.  
**Ragav Venkatesan**, Baoxin Li, “ **卷积神经网络与视觉计算** ”, 机械工业出版社, 2019.
- BOOK CHAPTERS (Bc1) Parag Chandakkar, **Ragav Venkatesan**, Baoxin Li, “Feature Extraction and Learning for Visual Data” in “ **Feature Engineering for Machine Learning and Data Analytics** ”, CRC Press, a Tyler & Francis company, 2017.
- THESIS (R1) **Doctoral dissertation** *Novel image features and learning techniques.* October 2017  
(R2) **Masters thesis** *Video Deinterlacing using Control Grid Interpolation Frameworks.* August 2012  
(R3) **Undergraduate thesis** *A comparative study of detection of faults and estimation of distance to faults on wired communication channels, using TDR and FDR techniques.* May 2010
- PEER-REVIEWED JOURNAL PUBLICATIONS **Multiple-Instance Learning**  
(J1) Parag Shridhar Chandakkar, **Ragav Venkatesan**, Baoxin Li, “ **MIRank-KNN: Multiple Instance Retrieval of Clinically-Relevant Diabetic Retinopathy Image** ”, in *SPIE Journal of Medical Imaging*, 2017.
- Image Interpolation**  
(J2) **Ragav Venkatesan**, Christine Zwart, David Frakes, Baoxin Li “ **Spatio-temporal Video Deinterlacing using Control Grid Interpolation** ”, in *SPIE Journal of Electronic Imaging*, 24(2), 023022. 2015.  
(J3) Christine Zwart, **Ragav Venkatesan**, David Frakes, “ **Decomposed Multidimensional Control Grid Interpolation for Common Interpolation-Based Image Processing Applications in Consumer Electronics** ”, in *SPIE Journal of Electronic Imaging*, vol. 24, no.4, pp.43012-1 to 43012-12. 2012.
- PEER-REVIEWED CONFERENCE PUBLICATIONS **Deep Learning**  
(C1) Xiang Xu, Xiong Zhou, **Ragav Venkatesan**, Gurumurthy Swaminathan, Orchid Majumdar “ **d-SNE: Domain Adaptation using Stochastic Neighborhood Embedding.** ”, in *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Long Beach, California, USA, 2019. [ORAL] (< 5.5% Acceptance Rate).  
(C2) **Ragav Venkatesan**, Jaya Vijetha Gattupalli, Baoxin Li, “ **On the generality of neural image features.** ”, in *IEEE International Conference on Image Processing (ICIP)*, Phoenix, Arizona, USA, 2016. [ORAL]
- Multiple-Instance Learning**  
(C3) **Ragav Venkatesan**, Parag Shridhar Chandakkar, Baoxin Li, “ **Simpler non-parametric methods provide as good or better results to multiple-instance learning.** ”, in *IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile 2015. [Spotlight]  
(C4) Parag Shridhar Chandakkar\*, **Ragav Venkatesan\***, Baoxin Li, Helen Li, “ **Retrieving clinically relevant diabetic retinopathy images using a multi-class multiple-instance framework** ”, in *proceedings of SPIE conference on Medical Imaging, International Society of Opticals and Photonics*, Orlando, Florida, USA, 2013. [ORAL]  
(C5) **Ragav Venkatesan\***, Parag Shridhar Chandakkar\*, Baoxin Li, Helen Li, “ **Classification of Diabetic Retinopathy Images Using Multi-Class Multiple-Instance Learning Based on Color Correlogram Features** ”, in *Proceedings of International Conference of the IEEE Engineering in Medicine and Biology Society 2012 (EMBC’12)*, San Diego, California, USA, 2012. [Poster]  
(C6) **Ragav Venkatesan\***, Parag Shridhar Chandakkar\*, Baoxin Li, Helen Li, “ **Clinically Relevant Diabetic Retinopathy Image Retrieval Using a Multi-Class Multiple Instance Framework** ”, in *proceedings of ACM conference on Bio-informatics, Computational Biology and Biomedicine (ACM-BCB’12)*. Orlando, Florida 2012. [ORAL]

## ADAS: Bayesian Modelling

- (C7) **Ragav Venkatesan**, Parag Shridhar Chandakkar, Baoxin Li, “ **Video-Based Self-Positioning for Intelligent Transport Systems Applications** ”, in *the Tenth International Symposium on Visual Computing (ISVC)*, Las Vegas, Nevada, USA, 2015. [ORAL]

## Image Interpolation

- (C8) **Ragav Venkatesan**, Christine Zwart, David Frakes, Baoxin Li, “ **Perception-Inspired Spatio-Temporal Video Deinterlacing** ”, in *the Eighth International Workshop on Video Processing and Quality Metrics for Consumer Electronics (VPQM)*, Tempe, Arizona, USA, 2014. [ORAL]
- (C9) **Ragav Venkatesan**, Christine Zwart, David Frakes, “ **Video Deinterlacing with Control Grid Interpolation Frameworks** ”, in *Proceedings of the IEEE International Conference on Image Processing (ICIP)*, Orlando, Florida, USA, 2012. [Poster]

\* - Equal contribution from authors.

## ARXIV PAPERS AND LONGFORMS

### Deep Learning

- (A1) **Ragav Venkatesan**, Hemanth Venkateshwara, Sethuraman Panchanathan, Baoxin Li., “A strategy for an uncompromising incremental learner.”, [arXiv: 1705.00744](#) 2017.
- (A2) **Ragav Venkatesan**, Vijetha Gattupalli, Baoxin Li., “Neural Dataset Generality.”, [arXiv: 1605.04369](#) 2016.
- (A3) **Ragav Venkatesan**, Baoxin Li., “Diving deeper into mentee networks.”, [arXiv: 1604.08220](#) 2016.

### Social Media Mining

- (A4) Lydia Manikonda, **Ragav Venkatesan**, Subbarao Kambhampati, and Baoxin Li., “Evolution of fashion brands on Twitter and Instagram.”, [arXiv: 1512.01174](#) 2015.

## TEACHING EXPERIENCE

- (T1) *Instructor - Arizona State University.*  
CSE 591: Introduction to deep learning for visual computing (January - May 2017)
- (T2) *Co-instructor - Arizona State University.*  
CSE 509: Digital Video Processing (August 2015 - December 2015)
- (T3) *Teaching Assistant - Arizona State University.*
- CSE 575: Statistical Machine Learning
    - Dr. Jingrui He (January 2015 - May 2015)
  - CSE 569: Fundamentals of Statistical Learning
    - Dr. Baoxin Li (August 2014 - December 2014 and August 2016 - December 2016)
  - CSE 509: Digital Video Processing
    - Dr. David Claveau (August 2012 - December 2012)
    - Dr. Hari Sundaram (August 2013 - December 2013)
  - CSE 424, 485 and 486: Capstone Projects (January 2013 - May 2013)
- (T4) *Guest Lectures - Arizona State University.*  
Duties in this position involve providing specific lectures in courses on invitation.
- CSE 569: Hidden Markov Models (September 2017)
  - CSE 569: Neural Networks (October - November 2017)

## SELECTED TALKS AND LECTURES

- (L1) **IEEE Conference on Computer Vision and Pattern Recognition**, - 2019.  
*Domain Adaptation using Stochastic Neighborhood Embedding.*
- (L2) **Microsoft Research, Redmond, Washington**, - 2019.  
*Common Dataset Issues and Solutions.*

- (L3) **Amazon A9 Computer Vision Conference**, - 2019.  
*Workshop on Amazon SageMaker.*
- (L4) **Seattle Machine Learning Meetup**, - 2019.  
*Amazon SageMaker Semantic Segmentation.*
- (L5) **ASU International Students Graduate Orientation**, - 2017.  
*Professional Networking for Graduate Students.*
- (L6) **Qualcomm**, San Diego, California, - 2017.  
*Tools for Measuring Images.*
- (L7) **Siemens**, Princeton, New Jersey, - 2017.  
*Measuring Images.*
- (L8) **International Conference on Image Processing**, Phoenix, Arizona - 2016.  
*Neural Dataset Generality.*
- (L9) **International Workshop on Video Processing and Quality Metrics for Consumer Electronics**, Chandler, Arizona, USA - 2014.  
*Perception-Inspired Spatio-Temporal Video Deinterlacing.*
- (L10) **SPIE conference on Medical Imaging**, Orlando, Florida, USA - 2013.  
*Retrieving clinically relevant diabetic retinopathy images using a multi-class multiple instance framework.*

#### SOFTWARE

- (S1) **Tf-Lenet** : Using LeNet as a case-study, this repository provides an in-depth migration guide from theano to tensorflow.
- (S2) **Yann** : Yet another neural network toolbox. A versatile toolbox for building various types of state-of-the-art Convolutional Neural Networks, with many options. This toolbox was written on top of theano and provides plug-and-play and modular capabilities of generating performance and research oriented deep convolutional neural networks.
- (S3) **InstaCrawl** : Toolkit for crawling down **Instagram**.
- (S4) **Search Engine** : Toolkit written in **PyLucene** for implementing vector-space similarities with additional options for Authorities and Hubs, Page Rank and other tools needed to construct a search engine.
- (S5) Open Source Contributions: Contributed to various open source repositories including **SageMaker Examples** , **SageMaker Python SDK** and **Gluon-CV** .

#### REFERENCES

Will be provided on request.