

# 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: <ul style="list-style-type: none"><li>• Neural Network Compression.</li><li>• Domain Adaptation.</li><li>• Multiple-Instance Learning.</li></ul>													
PROFESSIONAL EXPERIENCE	<p>(P1) Amazon</p> <table><tr><td>(A1) <i>Applied Scientist II - Amazon Alexa AI</i></td><td>November 2019 – Present</td></tr><tr><td>(A2) <i>Applied Scientist II - Amazon Web Services, AI Labs</i></td><td>May 2019 – November 2019</td></tr><tr><td>(A3) <i>Research Scientist - Amazon Web Services, Sagemaker</i></td><td>November 2017 – May 2019</td></tr></table> <p><i>Statistics of Tenure:</i></p> <ul style="list-style-type: none"><li>• Patents filed: 3.</li><li>• Peer-reviewed publications : 1.</li></ul> <p><i>External Artifacts:</i></p> <ul style="list-style-type: none"><li>• Amazon SageMaker Reinforcement Learning.</li><li>• Amazon SageMaker Object Detection Algorithms.</li><li>• Amazon SageMaker Semantic Segmentation Algorithms.</li><li>• Bring your own Tensorflow and MXNet models to Amazon SageMaker.</li><li>• Neural Network Compression using AWS Sagemaker Reinforcement Learning.</li></ul> <p><i>Teaching:</i></p> <table><tr><td>• Amazon A9 CVC workshop on AWS Sagemaker.</td><td>February 2019</td></tr><tr><td>• Convolutional Neural Networks at Machine Learning University.</td><td>2019 – 2018</td></tr><tr><td>• Deep Neural Network Bootcamp.</td><td>2018</td></tr></table> <p>(P2) <i>Research Assistant - Arizona State University.</i> August 2011 – October 2017</p> <p>(P3) <i>Computer Vision Research Intern - Intel Corp.</i> December 2013 – August 2014</p> <ul style="list-style-type: none"><li>• Built vehicle and lane detection for automated driver assistance systems applications.</li></ul>		(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	• Amazon A9 CVC workshop on AWS Sagemaker.	February 2019	• Convolutional Neural Networks at Machine Learning University.	2019 – 2018	• Deep Neural Network Bootcamp.	2018
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EDUCATION	<p><b>Doctor of Philosophy</b> - Computer Science October 2017 Advisor: Professor Baoxin Li Arizona State University, Tempe, Arizona, USA</p> <table><tr><td>• The Diabetic Retinopathy project</td><td>Funding Agency: National Institutes of Health.</td></tr><tr><td>• The MIDAS project</td><td>Funding Agency: National Science Foundation.</td></tr></table> <p><b>Master of Science</b> - Electrical Engineering August 2012 Advisor: Professor David Frakes Arizona State University, Tempe, Arizona, USA</p> <p><b>Bachelor of Engineering</b> - Electronics and Communication Engineering June 2010 Anna University, Chennai, Tamil Nadu, India</p>		• The Diabetic Retinopathy project	Funding Agency: National Institutes of Health.	• The MIDAS project	Funding Agency: National Science Foundation.								
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- 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 Images ”, 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 Optical 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.