

# Ragav Venkatesan

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[LinkedIn](#) [Personal Homepage](#) [Google Scholar](#) [GitHub](#)

PROFILE Research Scientist at AWS AI working on Amazon SageMaker, focused on emerging computer vision and machine learning technologies. Areas of specialties include:

- Neural Network Compression.
- [Convolutional neural networks](#).
- [Multiple-instance learning](#).

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

**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

PROFESSIONAL EXPERIENCE (P1) *Research Scientist - Amazon Web Services* November 2017 – Present

- Developed the following artifacts with the Amazon SageMaker Team:
  - [Amazon SageMaker Reinforcement Learning](#) .
  - [Amazon SageMaker Object Detection Algorithms](#) .
  - [Amazon SageMaker Semantic Segmentation Algorithms](#) .
  - [Bring your own Tensorflow and MXNet models to Amazon SageMaker](#).
- Teaching
  - Convolutional Neural Networks at Amazon Machine Learning University.
  - Deep Neural Network Bootcamp.

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

- [The Diabetic Retinopathy project](#) Funding Agency: National Institute of Health.
- [The MIDAS project](#) Funding Agency: National Science Foundation.
- Action recognition and capability modeling Funding Agency: National Science Foundation.

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

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

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

BOOKS (B1) **Ragav Venkatesan**, Baoxin Li, “ [Convolutional Neural Networks in Visual Computing: A Concise Guide](#) ”, CRC Press, a Tyler & Francis company, 2017.

BOOK CHAPTERS (C1) 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.

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) **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

(C2) **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.

(C3) 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]

(C4) **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.

(C5) **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.

### ADAS: Bayesian Modelling

(C6) **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

(C7) **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]

(C8) **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.

\* - Equal contribution from authors.

**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.

- (M1) **Ragav Venkatesan**, “ [Academic Dishonesty: On why integrity is an important virtue.](#) ”, in *The Education Plus column of The Hindu*, Oct 22nd 2012.

- (T1) *Instructor - Arizona State University.*  
[CSE 591: Introduction to deep learning for visual computing](#) (January - May 2017)  
[course website.](#)
- (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)

- (L1) **ASU International Students Graduate Orientation**, - 2017.  
*Professional Networking for Graduate Students*
- (L2) **Qualcomm**, San Diego, California, - 2017.  
*Tools for Measuring Images*
- (L3) **Siemens**, Princeton, New Jersey, - 2017.  
*Measuring Images*
- (L4) **International Conference on Image Processing**, Phoenix, Arizona - 2016.  
*Neural Dataset Generality*
- (L5) **International Workshop on Video Processing and Quality Metrics for Consumer Electronics**, Chandler, Arizona, USA - 2014.  
*Perception-Inspired Spatio-Temporal Video Deinterlacing.*
- (L6) **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 **Glueon-CV** .

## SYNERGISTIC ACTIVITIES

### Membership

- Student Member, IEEE.
- Member, IEEE Signal Processing Society.
- Member, IEEE Computer Society.
- Member, ASU Visual Representation and Processing Group.
- Member ASU CUbiC: Cognitive and Ubiquitous Computing Group.

### Reviewer

- IEEE Transactions of Neural Networks and Learning Systems, 2019.
- IEEE Winter Conference on Applications of Computer Vision, 2015 - 2019.
- ACM SIGGRAPH 2017.
- International Joint Conferences on Artificial Intelligence, 2017.
- IEEE International Symposium on Biomedical Imaging, 2016 -2017.
- IEEE Transactions on Circuits and Systems for Video Technology, 2013 - 2015.
- SPIE Journal of Electronic Imaging, 2013 - 2017.
- ASU-GPSA Centennial Professorship Award 2015.

### Student Volunteer

- IEEE International Conference on Image Processing, 2016.
- ACM Multimedia, Sedona, Arizona, USA, 2011.

### Mentoring

- Jaya Vijetha Reddy Gatupalli, MS Student.
- Yikang Li, MS Student.
- Anchit Agarwal, MS Student.

## CONFERENCES ATTENDED

- Amazon Machine Learning Conference, Seattle, Washington, 2018.
- ACM Turing Award Ceremony, San Francisco, California, 2017.
- Facebook Annual Machine Learning Seminar, Seattle, Washington, USA 2017.
- IEEE International Conference on Image Processing, Phoenix, Arizona, USA, 2016.
- IEEE International Conference on Computer Vision, Santiago, Chile, 2015.
- International Symposium on Visual Processing and Quality Metrics, Chandler, Arizona, USA, 2014.
- SPIE Conference on Medical Imaging Orlando, Florida, USA, 2013.
- ACM Conference on Multimedia, Scottsdale, Arizona, USA, 2011.

PROGRAMMING	<p><b>Programming Languages:</b> Python, Matlab, and L<sup>A</sup>T<sub>E</sub>X.</p> <p><b>Libraries:</b> Tensorflow, MxNet, Gluon, Theano, OpenCV, and other Python ML basics.</p>
AWARD AND GRANTS	<ul style="list-style-type: none"> <li>• ASU CIDSE travel grants (Multiple)</li> <li>• Facebook travel grant for Facebook machine learning seminar and tour 2017.</li> <li>• ACM SIGMM travel award for ACM Turing Award Ceremony, 2017.</li> </ul>
NONSCHOLASTIC ACTIVITIES	<p><b>Founder, administrator, executive member and various other offices</b> Online help forums for new incoming graduate students in organizations including ASU Launchpad (co-founder), United States-India Education Foundation, Chennai and others.</p> <p><b>Indian students association</b> Executive member, counsel and secretary of a major university student organization and interest group. Worked on promoting cultural and academic special-interest issues, drafted statements and policies. Managed events for upto 700 people-audience at prestigious venues.</p> <p><b>Thaalam Studios</b> Founder, owner and lead producer at self-funded music studio. <b>Le Kaapi Projekt</b> was music collaboration that was an outcome from this studio.</p> <p><b>ASU International Graduate Student Conference</b> Organized workshops on networking and career planning.</p>
REFERENCES	Will be provided on request.