

# Ragav Venkatesan

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PROFILE	Research Scientist at AWS AI working on Amazon SageMaker, focused on emerging computer vision and machine learning technologies. Areas of specialties include: <ul style="list-style-type: none"><li>• Neural Network Compression.</li><li>• Deep Neural Networks.</li><li>• Multiple-Instance Learning.</li></ul>	
EDUCATION	<b>Doctor of Philosophy</b> - Computer Science Advisor: Professor Baoxin Li Arizona State University, Tempe, Arizona, USA	October 2017
	<b>Master of Science</b> - Electrical Engineering Advisor: Professor David Frakes Arizona State University, Tempe, Arizona, USA	August 2012
	<b>Bachelor of Engineering</b> - Electronics and Communication Engineering Anna University, Chennai, Tamil Nadu, India	June 2010
PROFESSIONAL EXPERIENCE	(P1) <i>Research Scientist - Amazon Web Services</i> November 2017 – Present <ul style="list-style-type: none"><li>• Developed the following artifacts with the Amazon SageMaker Team:<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></ul></li><li>• Teaching<ul style="list-style-type: none"><li>– Amazon A9 CVC workshop on AWS Sagemaker. February 2019</li><li>– Convolutional Neural Networks at Amazon Machine Learning University. 2018</li><li>– Deep Neural Network Bootcamp. 2018</li></ul></li></ul>	
	(P2) <i>Research Assistant - Arizona State University.</i> August 2011 – October 2017 <ul style="list-style-type: none"><li>• The Diabetic Retinopathy project Funding Agency: National Institute of Health.</li><li>• The MIDAS project Funding Agency: National Science Foundation.</li><li>• Action recognition and capability modeling Funding Agency: National Science Foundation.</li></ul>	
	(P3) <i>Computer Vision Research Intern - Intel Corp.</i> December 2013 – August 2014 <ul style="list-style-type: none"><li>• Built vehicle and lane detection for automated driver assistance systems applications.</li></ul>	
THESIS	(R1) <b>Doctoral dissertation</b> <i>Novel image features and learning techniques.</i> October 2017 (R2) <b>Masters thesis</b> <i>Video Deinterlacing using Control Grid Interpolation Frameworks.</i> August 2012 (R3) <b>Undergraduate thesis</b> <i>A comparative study of detection of faults and estimation of distance to faults on wired communication channels, using TDR and FDR techniques.</i> May 2010	
BOOKS	(B1) <b>Ragav Venkatesan</b> , 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 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) **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.

## MEDIA

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

TEACHING  
EXPERIENCE

- (T1) *Instructor - Arizona State University.*  
CSE 591: Introduction to deep learning for visual computing (January - May 2017)  
url: <http://www.ragav.net/cse591>.
- (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) **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 Gluon-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

- Satyaki Chakraborty, Intern at AWS AI Labs.
- Jaya Vijetha Reddy Gatupalli, MS Student.
- Yikang Li, MS Student.
- Anchit Agarwal, MS Student.

## CONFERENCES ATTENDED

- Amazon A9 CVC, San Jose, 2019.
- 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

**Programming Languages:** Python, Matlab, and L<sup>A</sup>T<sub>E</sub>X.

**Libraries:** Tensorflow, MxNet, Gluon, Theano, OpenCV, and other Python ML basics.

#### AWARD AND GRANTS

- ASU CIDSE travel grants (Multiple)
- Facebook travel grant for Facebook machine learning seminar and tour 2017.
- ACM SIGMM travel award for ACM Turing Award Ceremony, 2017.

#### NONSCHOLASTIC ACTIVITIES

**Founder, administrator, executive member and various other offices** Online help forums for new incoming graduate students in organizations including ASU Launchpad (co-founder), United States-India Education Foundation, Chennai and others.

**Indian students association** 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.

**Thaalam Studios** Founder, owner and lead producer at self-funded music studio. Le Kaapi Projekt was music collaboration that was an outcome from this studio.

**ASU International Graduate Student Conference** Organized workshops on networking and career planning.

#### REFERENCES

Will be provided on request.