

# Ragav Venkatesan

---

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| CONTACT                 | 1800 9th Ave,<br>Amazon Alexandria SEA-18,<br>Seattle, WA-981010.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>email:</b> email@ragav.net<br><b>phone:</b> 480-414-1164<br><b>homepage:</b> http://ragav.net |
| 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<br>Advisor: Professor Baoxin Li<br>Arizona State University, Tempe, Arizona, USA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | October 2017                                                                                     |
|                         | <b>Master of Science</b> - Electrical Engineering<br>Advisor: Professor David Frakes<br>Arizona State University, Tempe, Arizona, USA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | August 2012                                                                                      |
|                         | <b>Bachelor of Engineering</b> - Electronics and Communication Engineering<br>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<br>(R2) <b>Masters thesis</b> <i>Video Deinterlacing using Control Grid Interpolation Frameworks.</i> August 2012<br>(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) Xiang Xu, Xiong Zhou, **Ragav Venkatesan**, Gurumurthy Swaminathan, Orchid Majumdar “ dSNE: Domain Adaptation using Stochastic Neighborhood Embedding ”, in *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Long Beach, California, USA, 2019.
- (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.
- (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.
- (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.
- 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.
- \* - Equal contribution from authors.

#### ARXIV PAPERS

#### 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.