

# Rahul Duggal

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## EDUCATION

- Georgia Institute of Technology**, College of Computing **2018 – 2022**  
▪ Ph.D. in Computer Science (GPA : 4.0/4.0)
- University of Delhi**, Netaji Subhas Institute of Technology, India **2011 – 2015**  
▪ Bachelors (B.E.) in Computer Engineering (GPA : 3.5/4.0)

## PROFESSIONAL EXPERIENCE

- Applied Scientist II, Amazon (AWS-AI Computer Vision)** **Oct 2022 – Present**  
▪ Researching and developing novel computer vision algorithms for diverse applications.
- Research Intern, Amazon (AWS-AI Computer Vision)** **May 2021 – Aug 2021**  
▪ Developed a novel architecture search method for designing regression-free models suited to diverse compute platforms.
- Research Intern, Amazon (AWS Rekognition)** **May 2020 – Nov 2020**  
▪ Developed a novel neural architecture search method for open set, image retrieval applications such as fashion retrieval and face recognition.
- Software Developer, Epic Systems**, Madison, WI, USA **Oct 2017 – Jun 2018**  
▪ Developed software for scheduling and documenting surgery time procedures.
- Research Assistant**, SBILab at IIIT-Delhi, India [[Lab Page](#)] **Jan 2016 – Sep 2017**  
▪ Researched computer vision methods to diagnose Leukemia from medical images.

## SELECTED PUBLICATIONS

- [17] G. Li, [R. Duggal](#), A. Singh, K. Kundu, B. Shuai, J. Wu “**Robustness Preserving Fine-tuning using Neuron Importance**”, European Conference of Computer Vision (ECCV), Italy, 2024.
- [16] Y. Kim, J. Fang, Q. Zhang, Z. Cai, Y. Shen, [R. Duggal](#), D. Raychaudhury, Z. Tu, Y. Xing, O. Dabeer “**Open-World Dynamic Prompt and Continual Visual Representation Learning**”, European Conference of Computer Vision (ECCV), Italy, 2024. .
- [15] S. Peng, W. Xu, C. Cornelius, M. Hull, K. Li, [R. Duggal](#), M. Phute, P. Chau, J. Martin “**Robust Principles: Architectural Design Principles for Adversarially Robust CNNs**”, British Machine Vision Conference (BMVC), UK, 2023.
- [14] H. Park, S. Lee, B. Hoover, A. Wright, O. Shaikh, [R. Duggal](#), N. Das, J. Hoffman, P. Chau, “**ConceptEvo: Interpreting Concept Evolution in Deep Learning Training**”, ACM International Conference on Information and Knowledge Management (CIKM), UK, 2023.
- [13] K. Li, [R. Duggal](#), P. Chau, “**Evaluating Robustness of Vision Transformers on Imbalanced Datasets**”, the AAAI Conference on Artificial Intelligence Abstracts (AAAI), USA, 2023.
- [12] [R. Duggal](#), H. Zhou, J. Fang, S. Yang, Y. Xiong, W. Xia, “**Towards Regression-Free Neural Networks for Diverse Compute Platform**”, European Conference on Computer Vision (ECCV), Israel, 2022. [[paper](#)]
- [11] S. Freitas, [R. Duggal](#), P. Chau, “**MalNet: A Large-Scale Cybersecurity Image Database of Malicious Software**”, IEEE International Conference on Information and Knowledge Management (CIKM), USA, 2022. [[paper](#)]

- [10] R Duggal, H. Zhou, S. Yang, Y. Xiong, W. Xia, Z. Tu, S. Soatto “**Compatibility-aware Heterogeneous Visual Search**”, IEEE Computer Vision and Pattern Recognition (CVPR), USA, 2021. [[Paper](#)]
- [9] R Duggal, S. Freitas, S. Dhamnani, P. Chau, J. Sun, “**HAR: Hardness Aware Reweighting for Imbalanced Datasets**”, IEEE International Conference on Big Data (BigData), USA, 2021. , [[paper](#)]
- [8] R Duggal, C Xiao, R. Vuduc, P. Chau, J. Sun, “**CUP: Cluster Pruning for Compressing Deep Neural Networks**” , IEEE International Conference on Big Data (BigData), USA, 2021. [[paper](#)]
- [7] H Park, N. Das, R Duggal, A. Wright, O.Shaikh, F. Hohman, P. Chau “**NeuroCartography: Scalable Automatic Visual Summarization of Concepts in Deep Neural Networks**” , IEEE Transactions on Visualization and Computer Graphics (TVCG), IF: 4.5) 2021, [[Paper](#)]
- [6] R Duggal\*, S. Freitas\*, C. Xiao, D.H. Chau, J. Sun, “**REST: Robust and Efficient Neural Networks for Sleep Staging in the Wild**”, The World Wide Web Conference (WWW), Taiwan, 2020. [[Paper](#)][[Code](#)]
- [5] A. Gupta, R Duggal, S.Gehlot, R. Gupta, A. Mangal, L. Kumar, N. Thakkar, D. Satpathy “**GCTI-SN: geometry-inspired chemical and tissue invariant stain normalization of microscopic medical images**”, Medical Image Analysis (IF: 11.1) 2020. [[Paper](#)]
- [4] A Gupta, P. Mallick, O.Sharma, R. Gupta, R Duggal “**PCSeg: Color model driven probabilistic multiphase level set based tool for plasma cell segmentation in multiple myeloma**”, PLoS one (IF: 3.24) 2018. [[Paper](#)]
- [3] R Duggal, A Gupta, et al, “**SD-Layer: Stain Deconvolutional layer for CNNs in Medical Microscopic Imaging**”, 20<sup>th</sup> International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Canada, 2017. [[Paper](#)][[Code](#)]
- [2] R Duggal, A Gupta, “**P-TELU: Parametric Tan Hyperbolic Linear Unit Activation for Deep Neural Networks**”, International Conference on Computer Vision (ICCV) Workshops, 2017 [[Paper](#)]
- [1] R Duggal, A Gupta, et al, “**Overlapping Cell Nuclei Segmentation in Microscopic Images Using Deep Belief Networks**”, 10<sup>th</sup> Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), India 2016. [[Paper](#)][[Code](#)]

#### REVIEWER

- T-PAMI 2023
- CVPR 2021, 2022, 2024
- ECCV 2024
- ICCV 2021, 2023
- ECML-PKDD 2022
- ICLR 2019
- ICML 2019
- KDD 2020, 2021

MENTORING	<ul style="list-style-type: none"> <li>▪ Yuxiao Chen (Summer '24): PhD CS at Rutgers University, USA</li> <li>▪ Jongwoo Park (Summer '24): PhD CS at Stony Brook University, USA</li> <li>▪ Guangrui Li (Spring '24): PhD CS at University of Sydney, Australia</li> <li>▪ Youngeun Kim (Summer '23): PhD ECE at Yale University, USA</li> <li>▪ Sharath Girish (Summer '23): PhD CS at University of Maryland at College Park, USA</li> <li>▪ Anthony Peng (Spring '22): PhD CS at Georgia Tech, USA</li> <li>▪ Kevin Li (Fall '21, Spring '22): BS CS at Georgia Tech (Now ML PhD at Carnegie Mellon)</li> </ul>
SERVICE	<b>Teaching Assistantship</b> <ul style="list-style-type: none"> <li>▪ Graduate Deep Learning (CS 7643) with Prof. Zsolt Kira (Spring 2020, Spring 2021)</li> </ul>
PRESS	<ul style="list-style-type: none"> <li>▪ [<a href="#">Amazon Science</a>, <a href="#">ZDNet</a>] "Graceful AI"</li> <li>▪ [<a href="#">Georgia Tech</a>, <a href="#">TechXplore</a>, <a href="#">Alhub</a>] "Machine Learning Technique Helps Wearable Devices Get Better at Diagnosing Sleep Disorders and Quality"</li> </ul>
TALKS	<ul style="list-style-type: none"> <li>▪ New principles and frameworks for empowering AI on edge devices, <i>Georgia Tech</i> (Jul '22)</li> <li>▪ New principles and frameworks for empowering AI on edge devices, <i>Apple AI</i> (Dec '21)</li> <li>▪ Regression Constrained Neural Architecture Search, <i>Amazon AI, CV</i> (Aug '21)</li> <li>▪ Compatibility-aware Visual Search, <i>Amazon AWS Rekognition</i> (Nov '20)</li> </ul>
AWARDS	<ul style="list-style-type: none"> <li>▪ Amazon post internship fellowship worth USD 20,000 to fund the last semester of my PhD. <b>2021-2022</b></li> <li>▪ Selected to attend the <b>Summer School on Deep Learning</b> at IIIT Hyderabad. <b>Secured 1st position (overall)</b> among 150 attendees wherein all participants were ranked in 5 daily challenges. Reward entailed a travel grant to CVPR 2018 and a cash prize. <b>2017</b></li> <li>▪ Awarded the <b>Indian Association for Research in Computer Science (ACM-IARCS)</b> travel award to present my paper at MICCAI 2017, Quebec City, Canada. <b>2017</b></li> <li>▪ Ranked 217 all India for <b>ACM ICPC</b> Regionals. <b>2014</b></li> <li>▪ <b>All India Engineering Entrance Exam</b> - Top 0.2 percent among 1.2 million candidates.</li> <li>▪ <b>IIT Joint Entrance Exam</b> - Top 0.9 percent among 0.5 million candidates.</li> <li>▪ Won a team Gold and an individual Bronze medal (among 77 teams from 11 countries) at the 4th International Young Mathematician's Convention (<b>IYMC</b>). <b>2008</b></li> <li>▪ <b>National Cyber Olympiad</b> - All India Rank 128 (qualified for the 2nd stage). <b>2008</b></li> </ul>
SKILLS	<p><b>Deep Learning Libraries</b> : Pytorch (fluent), Mxnet (fluent), Tensorflow (Basic), Caffe (basic), Theano (basic).</p> <p><b>Web Platforms</b> : MeteorJS (fluent), Node (basic).</p> <p><b>Version Management</b> : Git (fluent)</p> <p><b>Datastructures &amp; Algorithms</b></p> <p>Was active on several sport programming platforms through my handle jonvonneumann.</p> <ul style="list-style-type: none"> <li>▪ Codeforces : Peak Rating 1682, <b>title - Expert</b>.</li> <li>▪ Codechef : 131 problems solved, <b>peak global rank 307</b>.</li> <li>▪ Ranked 186 and 168 worldwide, in google APAC rounds A and B. Invited to interview onsite at Google. <b>2014</b></li> </ul>