Georgios Georgiadis

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Research Interests

I have extensive experience in Computer Vision, Machine Learning and Deep Learning research. I am currently leading the Deep Learning efforts in Natural Language Image Search at Microsoft. I also had the privilege to work on a few groundbreaking projects such as GPT-4 Turbo with Vision and Smart Cropping. I served as the principal investigator for Responsible AI evaluation and mitigations of major Azure Vision products including GPT-4V and Image Search. Previously, I was leading the Neural Network hardware accelerator software team at Samsung. I have significant research experience developing algorithms that accelerate and compress Neural Networks. During my PhD thesis, I dealt with video understanding, texture/structure partition, texture compression, synthesis and video compression. I have also worked on problems related to video segmentation, scene flow and texture segmentation. I have been exposed through research or graduate-level courses to Machine Learning, Video and Image Processing and Convex Optimization.

Education

UCLA	**PhD in Computer Science** (Advisor: Prof. Stefano Soatto)	9/2010 – 9/2015
	Major field: Computer Vision.	
	Minor fields: Artificial Intelligence, Systems and Signals.	
	M.Sc. in Computer Science	9/2010 – 3/2013
	Focus on Computer Vision, Machine Learning and Statistics.	
Stanford University	**M.S. in Electrical Engineering**	9/2008 – 3/2010
	Focus on Computer Vision, Signal and Image Processing.	
	Projects: Image understanding, independent study work with Prof. Fei-Fei Li.	
Imperial College	**MEng. in Electrical and Electronic Engineering with First Class Honors**	9/2004 – 6/2008
	Focus on Digital Signal Processing.	

Employment History

Microsoft	**Principal Software Engineer**	09/2019 – Pres.
	Leading S/W teams in image search in Azure Cognitive Services.	
	Responsible AI evaluation and mitigation for major Azure Vision products (search, GPT-4V).	
	Integrated GPT-4V workflows in systems and services.	
	Developed & shipped a smart cropping algorithm serving billions of images per month.	
	Developed & shipped optimized neural networks for Azure Cognitive Services Custom Vision.	
	Developed & shipped features for Custom Vision's AutoML.	
	Intern Mentor.	
Samsung	**Senior Deep Learning Research Team Lead**	11/2018 – 09/2019
	Leading S/W team in deep learning research.	
	Senior Computer Vision Scientist	1/2017 – 11/2018
	Accelerating Neural Networks via algorithmic designs.	
	Main topics of research: Pruning, Quantization, Compression.	
Dolby Laboratories	**Research Engineer, Image Technology**	12/2015 – 1/2017
	Applied Machine Learning techniques in video shot detection to achieve state-of-the-art performance, developed an image QA system to automate the encoding process of video and developed an image denoising algorithm that was incorporated in the encoding process under the Dolby Vision framework.	
	Research Intern	5/2015 – 7/2015
	Designed a video segmentation system that is competitive with state-of-the-art.	
	Research Intern	6/2014 – 9/2014
	Designed a scene flow algorithm that achieves state-of-the-art performance.	
HBO Inc.	**Technical Consultant**	5/2014 – 5/2014
	Technical analysis on topics for the T.V. show "Silicon Valley".	
Adobe Systems Inc.	**Emerging Graphics Group Intern**	6/2013 – 9/2013
	Designed a texture segmentation algorithm that competing recent approaches.	

UCLA	**Teaching Assistant** (Introduction to Computer Graphics)	3/2012 – 6/2012
	Graduate Student Researcher (Research in Computer Vision)	9/2010 – 9/2015
Princeton University	**Visiting Student Research Collaborator** Worked on quickest detection theory in cognitive radio networks leading to a journal publication.	7/2009 – 9/2009
Cyprus National Guard		7/2002 – 8/2004

Awards and Achievements

Reviewer for ICCV 2013, 2017 and CVIU. University fellowship at UCLA for the academic years 2010-11 and 2011-12. Won the Ideas Entrepreneurship Challenge of Imperial College (Winning prize was a £1,000 GBP, submitted a business idea called "LOWN" -Lights On When Needed). Associateship of the City and Guilds of London Institute (ACGI) with First Class Honors. Ranked top 4 out of 150 for overall performance at Imperial College. Commendation by the head of the EE department for ranking within the top 10 students in year 3 and top 12 in year 2.

Skills

Programming languages: Python, C++, C, Matlab.
Frameworks: Pytorch, Numpy, Scikit-learn, Tensorflow, Caffe.
Languages: Greek (Native language), English (Fluent), Polish (Advanced).

Patents

G.G., W. Deng, "Jointly Pruning and Quantizing Neural Networks", US Patent App. 17/943,176, 2023.

W. Deng, **G.G.**, "Self-Pruning Neural Networks for Weight Parameter Reduction", US Patent App. 17/572,625, 2022.

J. Fang, A. Shafiee, H. Abdel-Aziz, D. Thorsley, **G. G.**, J.H. Hassoun, "Piecewise Quantization for Neural Networks", US Patent App. 16/816,247, 2021.

E. Sakhaee, Liu Liu, **G.G.**, "Near-Infrared Spectroscopy (NIR) based Glucose Prediction Using Deep Learning", US Patent App. 16/402,204, 2020.

G.G., W. Deng, "Accelerating Long Short-Term Memory Networks via Selective Pruning", US Patent App. 16/223,105, 2020.

G.G., "Lossy Compression of Neural Network Activation Maps", US Patent App. 16/223,092, 2020.

G.G., "Lossless Compression of Neural Network Weights", US Patent App. 16/223,092 , 2020.

A. Partin, K. Thurston, **G. G**., "Color Image Modification with Approximation Function", US Patent App. 16/489,662, 2020.

G.G., "Lossless Compression of Sparse Activation Maps of Neural Networks", US Patent App. 16/046,993, 2019.

Z. Ji, J.W. Brothers, W. Deng, **G.G.**, "Methods and Algorithms for Reducing Computation for Deep Neural Networks via Pruning", US Patent App. 15/724,267, 2019.

N. Xu, **G.G.**, J. Crenshaw, "Coherent Motion Estimation for Stereoscopic Video", U.S. Provisional Patent Appl. 62/128,399, March 4, 2015.

Publications

J. Fang, A. Shafiee, H. Abdel-Aziz, D. Thorsley, **G. G.,** J.H. Hassoun, "Post-training Piecewise Linear Quantization for Deep Neural Networks", ECCV 2020.

G. G., "Accelerating Convolutional Neural Networks via Activation Map Compression", IEEE CVPR, 2019.

G. G., S. Soatto, "A Mid-Level Representation of Visual Structures for Video Compression", IEEE WACV, 2016.

G. G., "Scene Representations for Video Compression", PhD Thesis at University of California, Los Angeles, 2015.

G. G., A. Chiuso, S. Soatto, "Texture Representations for Image and Video Synthesis", IEEE CVPR, 2015.

G. G., S. Soatto, "Exploiting Temporal Redundancy of Visual Structures for Video Compression", DCC, 2015.

G. G., A. Chiuso, S. Soatto, "Texture Compression", DCC, 2013.

G. G., A. Ravichandran, S. Soatto and A. Chiuso, "Encoding Scene Structures for Video Compression", SPIE, 2012.

G. G., A. Ayvaci and S. Soatto, "Actionable Saliency Detection: Independent Motion Detection Without Independent Motion Estimation", IEEE CVPR, 2012.

G. G., S. Soatto, "Scene-Aware Video Modeling and Compression", DCC, 2012.

L. Lai, H. V. Poor, Y. Xin and **G. G.**, "Quickest search over multiple sequences", IEEE TIT, 2011.

L. Lai, H. V. Poor, Y. Xin and **G. G.**, "Quickest Sequential Opportunity Search in Multichannel Systems", IWAP, 2010.

G. Leseur, N. Meunier, **G. G.**, L. Huang, J. DiCarlo, B. Wandell and P. B. Catrysse, "High-speed document sensing and misprint detection in digital presses", SPIE, 2010.

G.G., "Parametric modelling and control of hybrid vehicles", Final year dissertation at Imperial College, 2008.