

Chirag Agarwal

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EDUCATION

University of Illinois at Chicago Ph.D. in Electrical and Computer Engineering – Advisors: Dr. Dan Schonfeld and Dr. Anh Nguyen – Thesis: “Robustness and Explainability of Deep Neural Networks”	Chicago, IL 2014–2020
University of Illinois at Chicago M.S. in Electrical and Computer Engineering – Project: Fall detection of elderly patients	Chicago, IL 2017
Future Institute of Engineering and Management B.Tech in Electronics and Communication Engineering – Project: Finger-print Recognition using Fourier Transform	Kolkata, India 2008–2012

EXPERIENCE

Harvard University Postdoctoral Fellow in Harvard Medical School Advisor: Dr. Hima Lakkaraju and Dr. Marinka Zitnik	Boston, MA 2020 –Current
Auburn University Research Assistant Advisor: Dr. Anh Nguyen	Auburn, AL Summer 2019
Robert Bosch LLC Computer Vision/Augmented Reality Intern	Sunnyvale, CA Summer 2018
Tempus labs Inc. Imaging Science Intern	Chicago, IL Spring 2018
Kitware Inc. Research and Development Intern	Clifton Park, NY Summer 2017
Geisinger Health Systems Research Intern	Danville, PA Summer 2016

PUBLICATIONS

Articles in peer-reviewed Journals

1. B. Prasad*, C. Agarwal*, E. Schonfeld, D. Schonfeld, B. Mokhlesi: Deep learning applied to polysomnography to predict blood pressure in obstructive sleep apnea and obesity hypoventilation: A proof-of-concept study, *Journal of Clinical Sleep Medicine (JCSM)*, 2020
2. C. Agarwal, J. Klobusicky, D. Schonfeld: Convergence of backpropagation with momentum for network architectures with skip connections, *Journal of Computational Mathematics (JCM)*, 2019
3. E. Cha, Y. Veturi, C. Agarwal, M. Arbabshirani, S. Pendergrass: Using Adipose Measures from Electronic Health Record Imaging Based Data for Discovery, *Journal of Obesity*, 2018

Articles in peer-reviewed conference proceedings

1. **C. Agarwal***, S. Khobahi*, D. Schonfeld, M. Soltanalian: CoroNet: A Deep Network Architecture for Semi-Supervised Task-Based Identification of COVID-19 from Chest X-ray Images, *SPIE Medical Imaging*, 2020
2. **C. Agarwal**, A. Nguyen: Explaining image classifiers by removing input features using generative models , *Asian Conference on Computer Vision (ACCV)*, 2020 – Acceptance rate ($\sim 22\%$)
3. N. Bansal*, **C. Agarwal***, A. Nguyen*: SAM: The Sensitivity of Interpretability Methods to Hyperparameters, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020 – Oral presentation ($\sim 5\%$)
4. **C. Agarwal**, S. Khobahi, A. Bose, M. Soltanalian, D. Schonfeld: Deep-URL: A Model-Aware Approach To Blind Deconvolution Based On Deep Unfolded Richardson-Lucy Network, *IEEE Conference on Image Processing (ICIP)*, 2020 – Acceptance rate ($\sim 42\%$)
5. **C. Agarwal**, A. Nguyen, D. Schonfeld: Improving Robustness to Adversarial Examples by Encouraging Discriminative Features, *IEEE Conference on Image Processing (ICIP)*, 2019 – Spotlight (top $\sim 10\%$)
6. M. Aloraini, M. Sharifzadeh, **C. Agarwal**, D. Schonfeld: Statistical Sequential Analysis for Object-based Video Forgery Detection, *Electronic Imaging*, 2019
7. N. Khobragade*, **C. Agarwal***: Multi-class segmentation of neuronal electron microscopy images using deep learning, *SPIE Medical Imaging*, 2018
8. **C. Agarwal**, M. Sharifzadeh, D. Schonfeld: CrossEncoders: A complex neural network compression framework, *IST International Symposium on Electronic Imaging*, 2018
9. M. Sharifzadeh, **C. Agarwal**, M. Aloraini, D. Schonfeld: Convolutional neural network steganalysis's application to steganography, *IEEE Visual Communications and Image Processing (VCIP)*, 2017
10. **C. Agarwal**, A.H. Dallal, M.R. Arbabshirani, A. Patel, G. Moore: Unsupervised quantification of abdominal fat from CT images using Greedy Snakes, *SPIE Medical Imaging*, 2017
11. A.H. Dallal, **C. Agarwal**, M.R. Arbabshirani, A. Patel, G. Moore: Automatic estimation of heart boundaries and cardiothoracic ratio from chest X-ray images, *SPIE Medical Imaging*, 2017
12. M.R. Arbabshirani, A.H. Dallal, **C. Agarwal**, A. Patel, G. Moore: Accurate segmentation of lung fields on chest radiographs using deep convolutional networks, *SPIE Medical Imaging*, 2017
13. **C. Agarwal**, A. Bose, S. Maiti, N. Islam, S.K. Sarkar: Enhanced data hiding method using DWT based on Saliency model, *IEEE International Conference on Signal Processing, Computing and Control (ISPCC)*, 2013
14. S. Maiti, **C. Agarwal**, A. Bose, S.K. Sarkar: Robust data hiding technique in wavelet domain using saliency map, *International Journal of Advances in Engineering and Technology*, 2013
15. N. Islam S. Maiti, A. Bose, **C. Agarwal**, S. K. Sarkar: An Improved Method of Pre-Filter Based Image Watermarking in DWT Domain, *International Journal of Computer Science and Technology*, 2013

Articles in peer-reviewed workshop proceedings

1. **C. Agarwal***, S. Hooker*: Estimating Example Difficulty using Variance of Gradients, *Workshop on Human Interpretability in Machine Learning (WHI)*, ICML, 2020 – Poster Presentation
2. **C. Agarwal***, P. Chen*, A. Nguyen: Intriguing generalization and simplicity of adversarially trained neural networks, *Workshop on Human Interpretability in Machine Learning (WHI)*, ICML, 2020 – Spotlight Presentation

Preprints

1. **C. Agarwal**, B. Dong, D. Schonfeld, A. Hoogs: An explainable adversarial robustness metric for deep learning neural networks, *arXiv*, 2018
2. M. Sharifzadeh, **C. Agarwal**, M. Salarian, D. Schonfeld: A new parallel message-distribution technique for cost-based steganography, *arXiv*, 2017

TEACHING

- **Teaching Assistant** at University of Illinois at Chicago Fall 2014 – Spring 2020
Pattern Recognition (ECE 407), Image Analysis and Computer Vision I (ECE 415),
Digital Signal Processing (ECE 417), Multimedia Systems (ECE 434),
Image Analysis and Computer Vision II (ECE 515), Neural Networks (ECE 559)

AWARDS

- Research Proposal accepted by Google Cloud Platform (US \$1,000) May, 2020
- Research Proposal accepted by Google Cloud Platform (US \$1,000) September, 2020
- Finalist for the Deans Scholarship Award at UIC 2018, 2019

COMMUNITY SERVICE

Organizer:

- Journal Club at University of Illinois at Chicago 2017–2018
- MATLAB workshop at University of Illinois at Chicago 2016

Program Committee:

- Workshop on Adversarial Robustness in the Real World (AROW), ECCV 2020
- Workshop on Human Interpretability (WHI) in Machine Learning, ICML 2020

Journal Reviewer:

- SN Computer Science – Springer Nature 2020
- Entropy 2020