

# Anirudh Choudhary

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CONTACT INFORMATION	2219, Marq on Ponce 116 Ponce de Lyon Ave NE Atlanta, Georgia 30308, USA	Mobile: (646) 251-4328, E-mail: <a href="mailto:achoudhary46@gatech.edu">achoudhary46@gatech.edu</a> Website: <a href="https://github.com/anic46">anic46.github.io</a>
RESEARCH INTERESTS	Computer Vision, Medical Image Processing, Machine Learning (Causal Inference)	
EDUCATION	<b>Georgia Institute of Technology</b> , Atlanta, USA <i>M.S. Computational Science and Engineering</i> (GPA: 3.83/4.00) <ul style="list-style-type: none"><li>Graduate Researcher at Biomedical Informatics Lab &amp; Medical Robotics Lab</li></ul> <b>Indian Institute of Management Calcutta</b> , Kolkata, India <i>Masters in Business Administration</i> (Top 20%) <b>Indian Institute of Technology Kharagpur</b> , Kharagpur, India <i>B.Tech &amp; M.Tech (Honors), Electrical Engineering</i>	<i>Aug'18 - present</i> <i>Jun'11 - Apr'13</i> <i>Jul'05 - May'10</i>
PUBLICATIONS	<b>A. Choudhary</b> , H. Wu, L. Tong, M. Wang, "Learning to Evaluate Color Similarity for Histopathology Images using Triplet Networks", ACM BCB'19 (Long Oral) M. Krishnan*, <b>A. Choudhary*</b> , C. Chakraborty, A.K. Ray, R. Paul, "Texture based segmentation of epithelial layer from oral histological images", Micron Journal ( <i>Elsevier</i> ), 2011 (*equal contribution) M. Krishnan, P. Shah, <b>A. Choudhary</b> , C. Chakraborty, R. Paul, A.K. Ray, "Textural characterization of histopathological images for oral sub-mucous fibrosis detection", Tissue Cell Journal ( <i>Elsevier</i> ), 2011 F.P. Ferrarese, N. Moretto, D. Botturi, <b>A. Choudhary</b> , G.A. Zamboni, "A new image processing filter for the automatic extraction of organs' internal structures: Application to liver tumors", ECR 2009 (Poster) <b>A. Choudhary</b> , N. Moretto, F.P. Ferrarese, G.A. Zamboni, "An entropy based multi-thresholding method for semi-automatic segmentation of liver tumors", MICCAI Workshop, 2008	
RESEARCH EXPERIENCE	<b>Medical Robotics and Automation Lab</b> , Georgia Tech; <i>Graduate Researcher</i> <ul style="list-style-type: none"><li>Developing stereo-based tracking approach for X-Ray arm's orientation estimation &amp; 3D CT reconstruction</li></ul> <b>Biomedical Informatics Lab</b> , Georgia Tech; <i>Graduate Researcher</i> <ul style="list-style-type: none"><li>Evaluated Optimal Transport based deep generative models for color transfer in pathology images</li><li>Compared GAN architectures (CycleGAN, DRIT), GMM &amp; exemplar based networks for stain transfer</li><li>Developed triplet loss based semi-supervised metric for evaluating color similarity of pathological images</li><li>Developing counterfactual bandit-based approach for robust offline policy learning on health records data</li></ul> <b>Centre for Spatial Planning</b> , Georgia Tech; <i>Research Assistant</i> <ul style="list-style-type: none"><li>Formulated multi-year highway infrastructure optimization framework with network reliability constraints</li><li>Implemented parallel Genetic Algorithm using OpenCL framework for large scale MDP optimization</li><li>Simulated traffic routing using SUMO package and OpenStreetMap data for multiple pavement scenarios</li></ul> <b>B.Tech &amp; M.Tech Thesis</b> , IIT Kharagpur <ul style="list-style-type: none"><li>Oral cancer detection in pathology images using spatial &amp; wavelet based texture features (91% accuracy)</li><li>Designed novel epithelial layer segmentation method combining Gabor filters &amp; multi-variate watershed</li></ul> <b>Biomedical Image Analysis Lab</b> , University of Pennsylvania; <i>Research Intern</i> <ul style="list-style-type: none"><li>Cerebellum segmentation in MRI images using 3D Gabor features based Demons registration &amp; SVM</li><li>Developed novel skull stripping method using level set registration with MRF based tissue classification</li></ul> <b>Altair Robotics Laboratory</b> , University of Verona, Italy; <i>Research Intern</i> <ul style="list-style-type: none"><li>Developed an automated liver tumor detection algorithm for abdominal CT scans (75% ROI overlap); Applied spline interpolation, watershed segmentation &amp; cross-entropy minimization based thresholding</li><li>Work incorporated into Mirosurge robotic platform; Stood 4th in MICCAI's tumor segmentation challenge</li></ul>	<i>Fall 2019</i> <i>Spring 2019 - present</i> <i>Fall 2018 - Spring 2019</i> <i>Fall 2008 - Spring 2010</i> <i>Summer 2009</i> <i>Summer 2008</i>
COURSES	Computer Vision, Graphical Models, Deep Learning, Machine Learning, ML with Limited Supervision, Artificial Intelligence, Pattern Recognition & Image Understanding, CSE Algorithms, Signals & Networks	

PROFESSIONAL EXPERIENCE	<b>Mastercard Advisors</b> , India; <i>Senior Analyst, Advanced Analytics</i> <span style="float: right;"><i>Sep'17 – Jul'18</i></span>
	<ul style="list-style-type: none"> <li>Developed unsupervised models to predict customer persona &amp; shopping behaviour using card transactions</li> <li>Implemented latent class analysis for lifestyle-based customer segmentation of Dubai based theme park</li> <li>Developed graph network based visualization tool to analyse shopping trips of Singapore based mall</li> <li>Developed shopping missions, campaign uplift models &amp; category performance dashboards for a leading South African grocery retailer (5M customers)</li> </ul>
	<b>Loyalty Partner</b> (AmEx subsidiary), India; <i>Manager, Customer Analytics</i> <span style="float: right;"><i>Jun'16 — Aug'17</i></span>
	<ul style="list-style-type: none"> <li>Led a team of 3 for spend analytics &amp; customer acquisition modelling for India's leading grocery retailer</li> <li>Designed campaign propensity models using logistic regression/CHAID leading to 10x uplift in response</li> <li>Developed XGBoost based model for gender prediction &amp; designed wallet potential estimation framework</li> <li>Business Excellence Award (2017) and Quarter Performance Award (Q4 2016)</li> </ul>
ACADEMIC ACHIEVEMENTS	<b>EXL Analytics</b> , India; <i>Manager, Decision Analytics</i> <span style="float: right;"><i>Jun'13 - Jun'16</i></span>
	<ul style="list-style-type: none"> <li>Pricing &amp; supply chain analytics for leading US insurer operating T-Mobile's phone trade-in program</li> <li>Led a team of 10 consultants; Formulated pricing and bidding allocation models for primary/secondary markets achieving 30% incremental profits; Developed generalized linear models for mobile price forecasting</li> <li>Developed ARIMAX based time series models for monthly trade-in volume forecasting (95% MAPE)</li> <li>Worked as Chief of Staff to Head of Insurance Operations Management (2013-15) - Supported CXOs in financial analysis, capacity optimization, merger planning &amp; strategy formulation (\$250M portfolio)</li> </ul>
	<b>Sabre Corporation</b> , India; <i>Associate Software Developer</i> <span style="float: right;"><i>Jul'10 – May'11</i></span>
	<ul style="list-style-type: none"> <li>Full-stack developer responsible for optimization &amp; enhancement of Travelocity.com's checkout module</li> <li>Resolved 20+ critical airline booking and checkout related software issues (\$8M revenue impact)</li> <li>High performance award (top 5 performers in Q1'11); Best technology award at Sabre Hack Day</li> </ul>
PROGRAMMING	NSF Travel Grant & Graduate Student Travel Award(Georgia Tech) - ACM BCB Conference, 2019
	Runners-up : Procter & Gamble's marketing strategy case-study competition, IIM Calcutta (2013)
	Finalist : Modulus, financial markets trading competition at IIM Calcutta's business summit (2012)
	Masters Research Scholarship and Indian Oil Scholarship at IIT Kharagpur, 2009
RECENT PROJECTS	Research Assistantships during internships at Univ. of Verona (2008) & Univ. of Pennsylvania (2009)
	Best Outgoing Technology Award, IIT Kharagpur (2010)
	Winner - National level product design competition at Entrepreneurship Summit, IIT Kharagpur (2010)
	All India Rank 68 in IIT Prelims Examination & 507 in All India Engineering Entrance Examination
REFERENCES	State Rank 5 in Regional Mathematical Olympiad (2002)
	Mamraj Agarwal Scholarship in Std 10 <sup>th</sup> ; CBSE Merit Certificate in Mathematics (top 0.01% - Std 12 <sup>th</sup> )
	Qualified for final round of KVPY & cleared state level of National Talent Search Examination (2001)
	C, C++, Python, PySpark, R, MATLAB, SQL, PyTorch, Tensorflow
	<b>Evaluating Tree Structures based RNN</b> , <i>ICLR Reproducibility Challenge</i> <span style="float: right;"><i>Spring 2019</i></span>
	<ul style="list-style-type: none"> <li>Empirical analysis of Ordered Neurons based LSTM(ON-LSTM) framework on language modeling tasks</li> <li>Incorporated ON-LSTM in ULMFiT framework &amp; evaluated performance on Toxic Comment identification</li> </ul>
	<b>Traveling Salesman Problem Solver</b> ; <i>Course Project (CSE Algorithms)</i> <span style="float: right;"><i>Fall 2018</i></span>
	<ul style="list-style-type: none"> <li>Evaluated Branch &amp; Bound, MST Approximation &amp; Local Search based approaches for solving TSP</li> <li>Implemented List based Simulated Annealing achieving 0-3% relative error on TSPLIB instances</li> </ul>
	<b>Vehicle Model Detection Network</b> , <i>Mastercard Advisors</i> <span style="float: right;"><i>Jun'18 - Jul'18</i></span>
	<ul style="list-style-type: none"> <li>Developed vehicle model detection algorithm for intelligent billboard marketing as part of AI Challenge</li> <li>Achieved 77% top-1 accuracy on 130 vehicle classes using Inception v3 based transfer learning</li> </ul>
	<b>Prof. May D. Wang</b> <span style="float: right;"><b>Prof. Christos Davatzikos</b></span>
	Georgia Institute of Technology <span style="float: right;">University of Pennsylvania</span>
	<b>Prof. Paolo Fiorini</b> <span style="float: right;"><b>Prof. A. K. Ray</b></span>
	University of Verona <span style="float: right;">IIT Kharagpur</span>