

SUMMARY	Computer Scientist working in Machine Learning with 8+ years research experience.	
INTERESTS	Machine Learning, Deep Learning, Natural Language Processing	
EDUCATION	Northwestern University , Evanston, Illinois USA	
	Ph.D., Computer Science	Sep '19
	Master of Science, Computer Science	
	Birla Institute of Technology & Science , Pilani, Rajasthan India	
	Master of Engineering, Software Systems	May '12
	Bachelor of Engineering, Chemical Engineering	
PROGRAMMING SKILLS	Proficient: Python, Keras, Scikit-Learn, NLTK, Gensim, Tensorflow, Pandas, Selenium Familiar: OpenCV, XGBoost, Spacy, PySpark, PyTorch, Theano, R, MATLAB, C, C++, Java, LAMP, SQL, weka, HTML/CSS	
PROFESSIONAL EXPERIENCE	<i>Machine Learning Scientist</i> , American Family Insurance , Madison, Wisconsin	Oct'19-
	<ul style="list-style-type: none"> Developing deep learning models for determining motor vehicle violation risk Designing insurance-based language models for predicting claims fraud 	
	<i>Data Science Intern</i> , Northwestern Mutual , Milwaukee, Wisconsin	Jun - Aug '18
	<ul style="list-style-type: none"> Developed distributed OCR algorithms for detecting responses from scanned questionnaires Designed a noise reduction algorithm to de-noise scanned and photocopied questionnaires 	
	<i>Data Science Consultant</i> , EDT	Jun '17 - Jan '18
	<ul style="list-style-type: none"> Designed models for profanity detection from company-wide email databases 	
RESEARCH PROJECTS	<i>Research Intern</i> , Boeing Cybersecurity , Sunnyvale, California	Jun - Sep '13
	<ul style="list-style-type: none"> Generated synthetic user profiles with different demographic and interest features for analyzing ads across profiles Developed a machine learning model for predicting user demographics and interests from ads 	
	<i>Research Assistant</i> , Northwestern University , Evanston, Illinois	Sep '12 -
	<ul style="list-style-type: none"> Chemical Property Prediction using Molecular Fingerprints (Tensorflow, Scikit Learn) <ul style="list-style-type: none"> Developed a multi-input input neural network architecture by merging different molecular representations (SMILES and fingerprints) for predicting chemical properties and reduced the mean absolute error by half compared to state-of-the-art architectures (CheMixNet architecture) Designed Bagged Ensemble models for predicting power conversion efficiency of solar cells using chemical fingerprints, and achieved mean absolute percentage error between 1.5-2 % Developed a transfer learning solution to predict solar cell properties with mean absolute percentage error below 1 % (SINet architecture) 	
	<ul style="list-style-type: none"> Developed Predictive Model for Additive Manufacturing (Tensorflow, Keras) <ul style="list-style-type: none"> Created time series models for temporal analysis of temperature and heat flux data Investigated Recurrent Neural Network models to predict point-wise temperature information for accelerating additive manufacturing simulations Developed an iterative real-time predictive model using bagged decision trees 	
	<ul style="list-style-type: none"> Ensemble Learning-based Guided Optimization for Aircraft Design (MATLAB, Python) <ul style="list-style-type: none"> Created intelligent sampling algorithms to explore the constrained search space for candidate microstructures Developed Feature Ranking-based Technique for Search Space Reduction of Constrained Non-Convex Optimization Achieved 100x more solutions compared to state-of-the-art methods that can accelerate the design-to-experiment life-cycle 	
	<ul style="list-style-type: none"> Classification of Anonymous Posts using Recurrent Neural Networks (Keras, Scikit Learn) <ul style="list-style-type: none"> Developed customized vector model using crowd-sourced (Urban Dictionary) & psycho-lingual (LIWC) dictionaries Explored Word2vec, GloVe and FastText embedding schemes (Gensim) Attained prediction accuracy of 79.8 % and 78.1 % using ensemble and LSTM models respectively 	

- Z. Yang, D. Jha, **A. Paul**, W. Liao, A. Choudhary and A. Agrawal. "Generative adversarial networks with mixture density networks for inverse modeling in materials microstructural design", *20th SIAM International Conference on Data Mining (SDM)* (under review)
- A. Paul**, M. Mozaffar, Z. Yang, W. Liao, A. Choudhary, J. Cao and A. Agrawal. "A real-time iterative approach for temperature profile prediction in additive manufacturing processes", *6th IEEE International Conference on Data Science and Advanced Analytics (DSAA)*
- A. Paul**, D. Jha, R. Al-Bahrani, W. Liao, A. Choudhary and A. Agrawal. "Transfer Learning Using Ensemble Neural Nets for Organic Solar Cell Screening", *International Joint Conference on Neural Networks*, 2019
- A. Paul**, A. Furmanchuk, W. Liao, A. Choudhary and A. Agrawal. "Property Prediction of Organic Donor Molecules for Photovoltaic Applications using Extremely Randomized Trees", *Journal of Molecular Informatics*, 2019
- A. Paul**, W. Liao, A. Choudhary and A. Agrawal. "Mining Anonymous Taboo Confessions using Psycho-lingual and Crowd-Sourced Dictionaries for Emotional Well-being", *Journal of Health Informatics Research* (under review)
- A. Paul**, P. Acar, W. Liao, A. Choudhary, V. Sundararaghavan and A. Agrawal. "Microstructure Optimization with Constrained Design Objectives using Machine Learning-Based Feedback-Aware Data-Generation", *Journal of Computational Materials Science*, 2019
- A. Paul**, D. Jha, R. Al-Bahrani, W. Liao, A. Choudhary and A. Agrawal. "CheMixNet: Mixed DNN Architectures for Predicting Chemical Properties using Multiple Molecular Representations", *NIPS Workshop on Machine Learning for Molecules and Materials*, 2018
- D. Jha, L. Ward, **A. Paul**, W. Liao, A. Agrawal, A. Choudhary and C. Wolverton. "ElemNet: Deep Learning the Chemistry of Materials From Only Elemental Composition", *Nature Scientific Reports*, 2018
- M. Mozaffar, **A. Paul**, R. Al-Bahrani, S. Wolff, A. Choudhary, A. Agrawal, K. Ehmann and J. Cao. "Data-Driven Prediction of the High-Dimensional Thermal History in Directed Energy Deposition Processes via Recurrent Neural Networks", *Manufacturing Letters*, 2018
- A. Paul**, P. Acar, R. Liu, W. Liao, A. Choudhary, V. Sundararaghavan and A. Agrawal. "Data Sampling Schemes for Microstructure Design with Vibrational Tuning Constraints", *Journal of American Institute of Aeronautics and Astronautics*, 2018
- J. Birnholtz, N. A. R. Merola, and **A. Paul**. "Is it Weird to Still Be a Virgin?: Anonymous, Locally Targeted Questions on Facebook Confession Boards", *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM, 2015.
- R. Liu, D. Palsetia, **A. Paul**, R. Al-Bahrani, D. Jha, W. Liao, A. Agrawal and A. Choudhary. "Pinterest: A Thematic Label Curation Tool for Large Image Datasets", *Proceedings of the Workshop on Open Science in Big Data at IEEE Bigdata Conference*, 2016.
- A. Paul**, A. Agrawal, W. Liao and A. Choudhary. "AnonyMine: Mining anonymous social media posts using psycho-lingual and crowd-sourced dictionaries", *Proceedings of the Workshop on Sentiment Mining at 22nd Annual ACM Conference on Knowledge Discovery and Data Mining*, 2016.

FELLOWSHIPS

McCormick Dean's Commendation Fellowship	'18 Spring
Predictive Science and Engineering Design Fellowship	'16-'17
Segal Design Fellowship	'14-'15
Walter P. Murphy Fellowship	'12-'13

SELECTED TEACHING AND LEADERSHIP

<i>Teaching Assistant & Guest Lecturer, Northwestern University</i>	Jan '14-
<ul style="list-style-type: none"> ◊ Prepared and delivered weekly lectures for 20-50 students ◊ Courses: Social Media Mining, Data Structures, Introduction to Programming (Python) 	
<i>President/Vice-President/Treasurer, Northwestern Toastmasters</i>	Sep '15 - May '18
<ul style="list-style-type: none"> ◊ Lead the Northwestern chapter of Toastmasters with over 30 graduate students, post doctoral fellows from 10 different departments ◊ Co-wrote proposal to The Graduate school and obtained 3000 USD to fund programming 	
<i>Co-Facilitator, Northwestern Dialogue Group</i>	Oct '16 - Sep '17
<ul style="list-style-type: none"> ◊ Facilitated dialogue in safe spaces for cultural exchange across international and domestic students ◊ Organized social events to enhance group cohesion 	
<i>Organizer & Instructor, Machine Learning Workshop, Northwestern University</i>	Jul '16
<ul style="list-style-type: none"> ◊ Delivered and prepared talk attended by 70 graduate students and professors ◊ Designed coding assignments for the participants 	