

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>Deep Learning Scientist</i> , American Family Insurance , Madison, Wisconsin		Oct'19-
	<ul style="list-style-type: none">Developing deep learning models for determining motor vehicle riskDesigning insurance-based language models		
	<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 questionnairesDesigned 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 (Narus) , 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 profilesDeveloped 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 dataInvestigated Recurrent Neural Network models to predict point-wise temperature information for accelerating additive manufacturing simulationsDeveloped 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 microstructuresDeveloped Feature Ranking-based Technique for Search Space Reduction of Constrained Non-Convex OptimizationAchieved 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) dictionariesExplored 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. “**Pinter-Net: 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 	