

SUMMARY	<ul style="list-style-type: none">• Computer Scientist working in Machine Learning with 8+ years research experience.• Interested in full-time positions starting Summer 2020.
INTERESTS	Machine Learning, Deep Learning, Natural Language Processing, Cheminformatics, Scientific Computing
EDUCATION	<p>Northwestern University, Evanston, Illinois USA</p> <p>Ph.D. Candidate, Computer Science Sep '19</p> <p>Master of Science, Computer Science</p> <p>Birla Institute of Technology & Science, Pilani, Rajasthan India</p> <p>Master of Engineering (with Honors), Software Systems May '12</p> <p>Bachelor of Engineering (with Honors), Chemical Engineering</p>
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	<p><i>Data Science Intern</i>, Northwestern Mutual, Milwaukee, Wisconsin Jun - Aug '18</p> <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 <p><i>Data Science Consultant</i>, EDT Jun '17 - Jan '18</p> <ul style="list-style-type: none">• Designed models for profanity detection from company-wide email databases <p><i>Data Science Consultant</i>, SnuvikTech Jan '18 - May '18</p> <ul style="list-style-type: none">• Developed time-series modeling for inventory data for computer accessories <p><i>Research Intern</i>, Boeing Cybersecurity (Narus), Sunnyvale, California Jun - Sep '13</p> <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
RESEARCH PROJECTS	<p><i>Research Assistant</i>, Northwestern University, Evanston, Illinois Sep '12 -</p> <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)• 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• 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• 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

- 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*
- 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", *19th IEEE International Conference on Data Mining (ICDM) (under review)*
- 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 ◇ Supervised course projects and provided subject matter expertise ◇ 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 ◇ Organized 1.5 hour weekly meetings to improve student public speaking skills ◇ 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 	