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## Summary

**Computer Scientist** working in **Machine Learning** with 5+ years research experience seeking full-time opportunities

## Education

**Northwestern University**, Evanston, Illinois USA [GPA: 3.7 / 4.0] **Jun 2019**
Ph.D. Candidate, Computer Engineering (expected)
Master of Science, Computer Science **Sep 2014**

**Birla Institute of Technology & Science**, Pilani, Rajasthan India
Master of Engineering (with Honors), Software Systems, May 2012 **May 2012**
Bachelor of Engineering (with Honors), Chemical Engineering, Dec 2009 **Dec 2009**

## Programming Skills

Proficient: Python, Keras, Scikit-Learn, Tensorflow, Selenium, OpenCV, PySpark
Familiar: R, MATLAB, C, C++, Java, PHP, LAMP, SQL, weka, Gephi, Javascript, html, css, Hadoop, Mahout, MPI

## Select Professional Experience

*Data Science Intern*, **Northwestern Mutual**, Milwaukee, Wisconsin **Jun - Aug 2018**
- ◇ Developed distributed image to text conversion algorithms for detecting responses from scanned questionnaires
- ◇ Designed a noise reduction algorithm to denoise scanned and photocopied questionnaires

*Research Intern*, **Boeing Cybersecurity (Narus)**, Sunnyvale, California **Jun - Sep 2013**
- ◇ 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

*Research Assistant*, **Northwestern University**, Evanston, Illinois (2012 - )

- Deep Learning-based Predictive Model for Additive Manufacturing (Tensorflow, Keras) **Nov 2016 -**
  - ◇ Created time series models for temporal analysis of heat flux data
  - ◇ Investigated Recurrent Neural Network models to predict point-wise temperature information for accelerating additive manufacturing simulations
- Solar Cell Efficiency Prediction using Molecular Fingerprints (Tensorflow, Scikit Learn) **Mar 2016 -**
  - ◇ Developed a multi-input input neural network architecture by merging different molecular representations as inputs for predicting chemical properties that outperformed other state-of-the-art models
  - ◇ Designed Deep Neural Network and Random Forest models for predicting power conversion efficiency of solar cells using chemical fingerprints, and achieved mean square percentage error between 1.5-2 %
- Ensemble Learning-based Guided Optimization for Aircraft Design (MATLAB, Python) **Oct 2015 - Dec 2017**
  - ◇ Created intelligent sampling algorithms to explore the constrained search space for candidate microstructures (constrained non-convex optimization problem)
  - ◇ Achieved 100x more solutions compared to state-of-the-art methods that can accelerate the design-to-experiment life-cycle
- Convolutional Neural Nets for Thematic Image Classification in Pinterest (Torch) **Oct 2015 - Sep 2016**
  - ◇ Harnessed Association Rule Mining for thematic label curation
  - ◇ Developed ConvNet Models for hierarchical classification that led to automated image categorization based on themes
- Classification of Anonymous Posts using Recurrent Neural Networks (Tensorflow) **Jan 2015 - May 2016**
  - ◇ Generated vectorizer models using Word2vec trained on crowd-sourced (Urban Dictionary) & psycho-lingual (LIWC) dictionaries(Gensim)
  - ◇ Attained prediction accuracy of 79.8 % and 78.1 % using LSTMs and ensemble models respectively

## Selected Teaching and Leadership

*President/Vice-President/Treasurer,* **Northwestern Toastmasters** **Sep 2015 -**
- ◇ Lead the Northwestern chapter of Toastmasters; over 30 graduate students, post doctoral fellows from 10 departments
- ◇ Organized 1.5 hour weekly meetings to improve student public speaking skills

*Teaching Assistant & Guest Lecturer,* **Northwestern University** **Jan 2014- June 2017**
- ◇ Prepared and delivered weekly lectures for multiple CS courses (Data Structures, Social Media Mining, Intro to Python) to 20-50 students

## Fellowships

McCormick Dean's Commendation Fellowship **2018 Spring**
Predictive Science and Engineering Design Fellowship **2016-2017**
Segal Design Fellowship **2014-2015**
Walter P. Murphy Fellowship **2012-2013**

## Selected Publications (5 of 14)

**A. Paul**, D.Jha, W. Liao, A. Choudhary and A. Agrawal."**Transfer Learning Using Ensemble Neural Nets for Organic Solar Cell Screening**", *International Joint Conference of Neural Networks, 2019*

**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**", *NeurIPS, 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*

**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 Issues of Sentiment Discovery and Opinion Mining at 22nd Annual ACM Conference on Knowledge Discovery and Data Mining, 2016.*