

# Jicheng Lu

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## MOTIVATION & OBJECTIVE

- Strongly desired to devote myself into deep learning research for real-world applications, bring and enhance my expertise.

## INTERESTS & SKILLS

- **Interests: Deep Learning, Machine Learning, Natural Language Processing, Optimization.**
- Data modeling skills: Building predictive models on large dataset using Random Forest, Neural Network, SVM, etc.
- Deep learning algorithms: Recurrent Neural Network (LSTM, GRU), Convolutional Neural Network, Autoencoder.
- Programming languages: Python, PyTorch, TensorFlow, C/C++, Java, JavaScript, Ruby, MATLAB.

## EDUCATION

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|-----------------|---|
| 2018.8 – 2020.5 | <b>Master of Science</b> in Computer Science, Texas A&M University, GPA: 4.0/4.0                      |
| 2013.9 – 2016.6 | <b>Master of Engineering</b> in Aeronautical Engineering, Shanghai Jiao Tong University, GPA: 3.8/4.0 |
| 2009.9 – 2013.6 | <b>Bachelor of Science</b> in Aeronautical Engineering, Shanghai Jiao Tong University, GPA: 3.6/4.0   |
- Academic scholarship: Third level of Shanghai Jiao Tong University (2011, 2012)

## PUBLICATIONS

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| Published | <b>Lu Jicheng</b> , SONG Wenbin, ZHENG Pengjun. “A Visualization Method for High-Dimensional Aerodynamic Optimization Problem”. ACTA Aerodynamic Sinica, 2018, 36(05):780-790.   |
| Published | <b>Lu Jicheng</b> , and Shima Hajimirza, “Optimizing sun-tracking angle for higher irradiance collection of PV panels using a particle-based dust accumulation model with gravity effect” Solar Energy 158(2017): 71-82. |

## RESEARCH & PROJECT EXPERIENCE

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|----------------|--|
| 2018.8-present | <b>Word Prediction in Natural Language Processing</b> (Advisor: Dr. Anxiao Jiang) <ul style="list-style-type: none"><li>➤ Implemented pre-trained embedding (GloVe) and <b>LSTM</b> cells to build deep <b>Recurrent Neural Network</b>.</li><li>➤ Designed a GUI in Python to demonstrate the performance of the <b>language model</b>. A test accuracy of 23% was achieved on the PTB dataset. (Demo: <a href="https://www.youtube.com/watch?v=bqGu3d6JceU&amp;t=1s">https://www.youtube.com/watch?v=bqGu3d6JceU&amp;t=1s</a>)</li><li>➤ Built a <b>word prediction system</b> using “Python-PyTorch” that predicts future words based on part of texts. A test F1 score of 0.14 (current best) was achieved on the BBC news dataset.</li><li>➤ Working on a <b>recommendation system</b> that recommends patients for trials based on medical records. Contents included: build synthetic patient data, generate synthetic criteria for medical trials, train neural network to generate SQL query from text criteria, build recommendation system for medical personnel.</li></ul> |
| 2019.9-2019.11 | <b>Transfer Learning in Machine Translation using RNN with Attention</b> (Team Role: Neural Network builder) <ul style="list-style-type: none"><li>➤ The project focused on storing encoder weights obtained when translating between one language pair (e.g., English to German) and applying them to translate on a different language pair (e.g., English to French).</li><li>➤ Implemented an <b>encoder-decoder</b> architecture in the neural network with <b>attention</b> using GRU cells.</li><li>➤ Applied the additive MLP-based attention mechanism to combine both encoder and decoder states.</li><li>➤ A current maximum improvement of 9% in BLEU score was achieved on the IWSL TED Talk dataset.</li></ul>   |
| 2019.2-2019.5  | <b>TAMU Uber Software Control of Autonomous Vehicle</b> (Team role: Full-stack Developer) <ul style="list-style-type: none"><li>➤ Developed a Web App that provides transportation service for handicapped students on campus.</li><li>➤ Developed a safety driver interface using <b>Ruby on Rails</b> to report vehicle status and weather condition.</li><li>➤ Performed <b>behavior and unit testing</b> using <b>Cucumber</b> and <b>Rspec</b> (Current best test coverage: 71%).</li></ul>   |

- 2018.8- **Database Management System and Tiny-SQL Interpreter** (Team role: Database Developer)
- 2018.12
- Developed a national ride-sharing system using **PHP-MySQL** so that users can post, cancel or pick a ride.
  - Developed a Java interpreter that processes **SQL** queries from users, e.g., select, insert, create, delete, drop.
  - Achieved better memory management by optimizing the execution order of cross join.
- 2017.8- **Spatial Analysis of Basketball Game using Machine Learning Method** (Advisor: Dr. Xiaoning Qian)
- 2017.12
- The algorithm was to analyze the spatial shot data of basketball players via an unsupervised protocol.
  - Constructed the **Log-Gaussian Cox Process** surface to model the spatial shot data.
  - Used the **elliptical slice sampling method** (a novel Monte Carlo algorithm) to maximize the posterior.
  - Used **Non-negative Matrix Factorization** (a dimensionality reduction technique) to decompose the intensity surface into low-rank matrices by minimizing KL loss.
- 2014.9- **Robust Global Optimization of Laminar Supercritical Airfoil** (Advisor: Dr. Wenbin Song)
- 2016.6
- Developed a **naturally-bounded parameterization method** to design airfoil for civil aircrafts.
  - Developed a multifunctional and interactive **visualization tool** in MATLAB to explore high-dimensional spaces for users when designing airfoils.
  - Established **an airfoil design system**, consisting of grid generation, CFD computation, airfoil shape optimization; The optimization is using **Response Surface method (Kriging)** with constraints on lift.
- 2013.9- **Teaching Assistant, School of Aeronautics and Astronautics, Shanghai Jiao Tong University**
- 2014.6
- Assisted professor to write summary report about aircraft design process.
  - Content included: aircraft design requirements, aircraft weight estimation, aerodynamic performance estimation of aircraft, aircraft performance estimation, aircraft powerplant, aircraft fuselage design, aircraft loading and structure, aircraft maneuverability and stability, economic analysis and airworthiness, etc.

## INTERNSHIP EXPERIENCE

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- 2019.6- **Full Stack Software Engineer** (Cooperative Agricultural Research Center at Prairie View A&M University)
- 2019.8
- Built a weather predictive model using **Random Forest, ANN and SVM** (current best R score: 0.97).
  - Developed an irrigation scheduling app, "IrrigWise", (using **Python-R-PHP-MySQL**) that provides users with crop irrigation suggestions at any farmland inside the country.
  - Improved "IrrigWise" so that users can observe the crop condition in the past and forecast in the future.
  - "IrrigWise" Demo: <http://irrigwise.pvamu.edu/introduction/>.

## Language Scores

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- TOEFL: 102 (Reading: 28, Listening: 22, Speaking: 22, Writing: 24).
- GRE: 319 (Verbal Reasoning: 155, Quantitative Reasoning: 164, Analytical Writing: 3.5)