

# WEIQUAN LUO

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## EDUCATION

### Master of Science

Iowa State University, Ames, IA, US

Major: Agricultural and Biosystems Engineering, Minor: Statistics, GPA: 3.65/4.0

Jan 2018 - May 2021

### Bachelor of Science

Iowa State University, Ames, IA, US

Major: Biological Systems Engineering, GPA: 3.66/4.0

Aug 2013 - Dec 2017

## KEY SKILLS & CERTIFICATE

### Technique:

Statistical method  
Optimization  
Experimental design

### Software:

Python, Shell script,  
R, MATLAB,  
SQL, Excel

### Certificate:

Tableau Specialist Certificate,  
Google Project Management  
Certificate

## PROFESSIONAL EXPERIENCE

### Data Scientist

May 2022 - Current, *Positron Emission Tomography (PET) Research Center*

- Developed a new algorithm based on **spatial statistics** that can bring radiomics to PET-only quantification
- Reduced runtime down 98% by **precompiling** the algorithm to machine code (7x) and **parallel computing** (8x)
- Improved the success rate from 61% to 95% by modifying the standard **Centiloid** pipeline
- Led the development of a new **quality assurance** procedure to ensure the accuracy of Centiloid results
- Proved the interchangeability of the standard and modified Centiloid pipelines (*HAI 2023 poster*)

### Data Analyst

Sept 2021 - May 2022, *Positron Emission Tomography (PET) Research Center*

- Compared the **template generating** method (Dartel, Shoot, and ANTs) with SSIM and NMI on 138 Down Syndrome T1-MRI scans (*AAIC2022/AIC poster*)
- Evaluate reduction of sampling site effect of brain cortical thickness and surface area with the **ComBat** algorithm
- Researched on existing image registrations, template generation methods, and harmonization technique
- Sampled PiB SUVr by processing brain MR and PET data to support the diagnosis of Alzheimer's disease

### Business Data Analyst, Intern

Apr - Aug 2021, *PF & XF Inc.*

- Formulated the analysis framework as a reserved toolbox to support decision making during business expansion
- Developed a groups-based advertising strategies classified by **RFM** model and geographical-based operating strategies based on **cross-analysis** of the user's geographical distribution and price sensitivity
- Developed short-, medium- and long-term brand planning using **Boston Matrix**

### Graduate Research Assistant, "Multiscale Analysis Framework"

Jun 2018 - Dec 2020, *Iowa State University*

- Designed a multiscale analysis framework consisting of **Markov random field** model and network analysis
- Collected gigabytes of spatiotemporal data from multiple sources using **APIs** and **regular expression**
- Speeded up the data processing by executing the ETL on different cores for nine specific spatiotemporal scales
- Characterized the relations among natural resources with significance test on **network statistics**

### Research Assistant, multiple projects

Aug 2017 - Jun 2018, *Iowa State University*

- Conducted **Meta-analysis** to comparing the effect of swine manure and commercial fertilizer on crop yield, water quality, gas emissions, and soil physicochemical properties
- Discovered signature behaviors for At-Risk Students to succeed with data-driven method (*ASABE 2018 poster*)

### Teaching Assistant, "Applied Numerical Methods"

Aug - Dec 2016, 2017, 2018, *Iowa State University*

- Mentored students on **optimization** theory and method using Excel Solver, Goal Seek, and MATLAB ODE solvers

## PUBLICATION

- He, Q.; Yang, W.; Luo, W.; Wilhelm, S.; Weng, B. Label-Free Differentiation of Cancer and Non-Cancer Cells Based on Machine-Learning-Algorithm-Assisted Fast Raman Imaging. *Biosensors* **2022**, *12*, 250.
- Luo, Weiqian. "Multiscale Analysis Framework for the Iowa Water-Energy-Food Nexus." Order No. 28316251 Iowa State University, **2021**. Ann Arbor: *ProQuest*. Web. 9 Dec. 2022.
- Luo, W.; O'Brien, P.L.; Hatfield, J.L. Crop Yield and Nitrous Oxide Emissions following Swine Manure Application: A Meta-Analysis. *Agric. Environ.* **2019**, *4*, 190024.