Hee Won Son

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Resume Summary

I have diverse experience leading **machine learning projects**, including water quality and earthquake predictions, and published a paper. Currently, I'm taking a course, **Software Development for Scientists and Engineers**, which focuses on **industrial software development**. As a personal side project, I'm building a resume helping word cloud using JavaScript. Since I am a fast learner with a strong background in algorithms, I believe I am adequate for fast-paced projects in the industry.

Education

Stanford University Stanford, CA
M.S. in Civil and Environmental Engineering, Class of 2023 Sep 2021 – Present
- Concentration: Environmental Data, Statistics, and Modeling
- Coursework: ***Software Development for Scientist and Engineer****, Programming Abstraction,* ***Design and Analysis of Algorithms*** *C++ Programming Laboratory, Deep Learning,*

Ewha Woman's University Seoul, South Korea
B.A. in Environmental Science and Technology Sep 2016 – Feb 2020
- Concentration: Environmental Data, Statistics, and Modeling

Experience

Resume Helper, *Stanford University* Sep 2022 -Present
- Built word cloud software in resume and cover letter helping format using JavaScript. Planning to publish in website.
- Provided job description from the user and provides technical skill related words and behavior related words separately.

Personal Responsive Webpage, *Stanford University* Jul 2022 -Aug 2022
- Constructed personal website using HTML, CSS, and JavaScript. Adapted for iPhone, iPad, and other small devices.
- Utilized Tailwind to make website responsive, well-designed, and user-friendly. **Website**

Machine Learning Models, Chlorophyll-a Concentration Prediction, *Stanford University* May 2022 – Jun 2022
- Forecasted Chlorophyll-a concentration in water with 16 potential impacting factors, using data from 2013 to 2021.
- Utilized LSTM, RF, SVR, and XGBoost with Pytorch and sklearn. Prediction accuracy was R^2 of 0.68, 0.60, and 0.66, respectively.

Transformer Model, Earthquake Prediction in Japan, *Stanford University* Mar 2022 – May 2022
- Predicted magnitude of earthquake in Japan after historical earthquake, 2013. Preprocessed data based on fault zones and maximum magnitude was taken each day. Established and shared model pipeline to facilitate experiments by three people.
- Utilized transformer with TensorFlow, prediction accuracy was R^2 of 0.70.

Trend and Change Point Detection, Climate Change Detection, *Stanford University* Sep 2021 – Dec 2021
- Detected change of trend or change point with p-values under 0.025 using two-sided Mann-Kendall and Cramer von Mises Method of SciPy. Stats for 12 locations based on moderate/wet/dry weather.
- Distinguished meaningful signs of climate change in five locations, especially in wet locations.

Machine Learning Models, Water Quality Prediction, *Ewha Womans University* Feb 2021 – Jul 2021
- Predicted concentration of total phosphorus in Euiam Lake, South Korea, using RF, XGBoost, DNN, and LSTM from TensorFlow.
- Prediction accuracy were R^2 of 0.7643, 0.8124, 0.7666, and 0.8529 respectively. Prediction in summer and autumn with LSTM model outperformed result of spring. Early attempt to predict phosphorus concentration with machine learning.
- Determined management priority using Gradient Tape and result from LSTM model. Primary factors of TP concentration in Euiam Lake were TP concentration from upper water impoundment among 40 potential affecting factors. **Publication**

Skills

- **Programming**: Python (Tensorflow, PyTorch, Pandas, Numpy, SciKit-Learn), C++, JavaScript, C#, Java, PHP, R, Matlab
- **Other**: HTML, CSS, TailwindCSS, Node.js, AWS, Git, Latex, Graphic Information System Mapping, Photoshop

Accomplishment and Recognition

Research Assistantship: Tracking and predicting source of pollutants in a stormwater detention pond. *Stanford University*
Best Bachelor's Thesis Award: Most remarkable undergraduate thesis nominated by faculties. *Ewha Womans University*
Deans List: Honored to undergraduate students who proved their remarkable academic ability. *Ewha Womans University*