

# Sangshik Park

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Visa Status: US Permanent Resident

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## EXPERIENCE

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- **Rockley Photonics** Irvine, CA  
*Senior Staff Algorithm Engineer* February 2022 -
  - **Blood Pressure:** Developed a blood pressure estimation algorithm using speckleplethysmography (SPG) signal.
- **Imperative Care** Campbell, CA  
*Principal Data Scientist* March 2020 - February 2022
  - **Anomaly Detection for Stroke Onset:** Developed a autoencoder-based anomaly detection algorithm using heart rate variability features to visualize stroke onset.
  - **Vasodilation:** Developed a PPG-based vasodilation detection algorithm using pulse wave analysis to improve stroke detection accuracy.
  - **Respiratory Rate:** Developed a PPG-based respiratory rate algorithm using particle filter and autoregressive method that outperforms traditional respiratory rate estimation methods.
- **Beddr** Mountain View, CA  
*Data Scientist* May 2019 - February 2020
  - **Wear-time Detection:** Designed a neural network model to accurately detect whether the device is in contact with the skin or not.
  - **SpO2:** Improved SpO2 accuracy using a weighted average algorithm and signal quality index.
  - **Heart Rate:** Improved heart rate accuracy by removing motion artifacts from the signal using adaptive filters.
- **Nulogix Health** Boston, MA  
*Machine Learning Engineer* August 2018 - May 2019
  - **Medical Billing Prediction:** Developed an AI-based medical billing model that predicts the amount of deductible, copay, and coinsurance.
  - **Anomaly Detection for Chest X-ray:** Developed a convolutional autoencoder-based model to extract features from chest X-ray images and used t-SNE to differentiate between normal and abnormal images.
- **Samsung Electronics** Gyeonggi, Korea  
*Senior Algorithm Engineer* November 2014 - December 2017
  - **Body Composition Analysis:** Designed a regression model using bioelectrical impedance to estimate body fat and skeletal muscle mass. Integrated this model into TomTom Touch.
  - **Sleep Stage Classification:** Developed a neural network model that utilizes ECG RR interval and peak amplitude to classify sleep stages.
  - **Motion Artifact Removal for Photoplethysmography:** Developed a PPG motion artifact removal algorithm using singular spectrum analysis.
  - **Heart Rate and Heart Rate Variability:** Developed an ECG peak detection algorithm to estimate heart rate and heart rate variability. Integrated this algorithm into Samsung's ECG S-Patch.
- **LG Electronics** Seoul, Korea  
*Research Engineer* July 2012 - July 2014
  - **Ultrasound Software Beamforming:** Developed a software-based plane wave beamforming algorithm for an ultrasound device.
  - **Optical Coherence Tomography for Dermatology:** Developed an algorithm for detecting structural changes related to skin aging, including collagen, dermal density, and wrinkles using optical coherence tomography.
- **Samsung Medison** Seoul, Korea  
*Associate Research Engineer* June 2007 - December 2010
  - **ElastoScan - Freehand Elastography:** Developed a real-time algorithm for estimating displacement and strain in freehand ultrasound elastography. Implemented noise removal algorithms including adaptive persistence and axial dropout correction.

## EDUCATION

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- **Georgia Institute of Technology** Atlanta, GA  
*Master of Science in Computer Science (Specialization: Machine Learning)* 2020 –
- **Seoul National University** Korea  
*Master of Science in Electrical Engineering and Computer Science* 2005 – 2007
- **Kyunghee University** Korea  
*Bachelor of Engineering in Electronics; GPA: 4.021/4.3* 2001 – 2005

## SKILLS

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- **Data Science**  
*Python, Pandas, Numpy, Scikit-learn, SciPy, Tensorflow, Pytorch, TensorRT*
- **Others**  
*MATLAB, C, R, Git, SQL, AWS*

## HONORS AND AWARDS

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- **2002** Korea Research Foundation Scholarship - Full Scholarship
- **2003** Korea Research Foundation Scholarship - Full Scholarship
- **2004** Korea Research Foundation Scholarship - Full Scholarship
- **2005** Award for Excellent Records (GPA: 4.021/4.3)
- **2005** Seoul National University Scholarship
- **2006** Samsung Medison Scholarship

## PATENTS

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- **US 20210106238** Systems and methods for multivariate stroke detection
- **US 20180333075** Respiratory Rate Measuring Method and Apparatus, and Wearable Device
- **US 20180359112** Home Device Control Device and Operation Method Thereof
- **US 20180228432** Method of Providing Service based on Biometric Information and Wearable Electronic Device
- **US 8337406 / EP 2189116** Adaptive Persistence Processing of Elastic Images
- **US 8503714** Dropout Correction in Ultrasound Strain Imaging
- **US 9125618** Providing an Elastic Image in an Ultrasound System
- **US 8834374 / EP 2289420** Setting an Optimal Image Parameter in an Ultrasound System
- **US 9289190** Ultrasound Strain Imaging via Pixel Frame and Window Correlation

## PUBLICATIONS

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- Speckle Reduction in Optical Coherence Tomography Images via Dynamic Infinite-Impulse-Response Filtering, J Lee, SS Park, JH Chung, SPIE, 2014