Yingjian Song

+86-18883994652 | ysong@alumni.stevens.edu
1996-06 | Male

EDUCATION

Stevens Institute of Technology. Aug 2018 - May 2019

Network & Communications Management & Service Master Hoboken, NJ

GPA: 3.875/4.0

Chongqing University of Posts and Telecommunications Sep 2014 - Jun 2018

Electronic Information Engineering Bachelor Chongqing, China

PUBLICATION

Y, Song. Research on high-precision wearable speed sensor for running[J] New Sports 2021.

WORK EXPERIENCE

Broad Sensor Nov 2020 - Jul 2021

Signal Processing and Machine learning algorithm engineer

- Resposible for algorithm development and optimization.

Visual Mind Jul 2021 - Present

Physiological signal processing algorithm engineer Beijing

- Develope physiological signal processing algorithm.

PROJECT EXPERIENCE

Physiological Parameters Calculation by NIR Jul 2021 - Present

- This project aims to detect whether the tester is nervous or lying by monitoring the change of HBO2 and HB etc.
- Set up NIR camera which consist of 2 infrared waves with different wavelength to detect face of tester and track ROI.
- Construct time series of signal by obtaing the intensity of insteresting area of face.
- Develop motion robutness algorithm to denosie time series signal.
- Extract heart rate and respiratory rate by bandpass filter, EEMD and FFT.
- Calculate HBO2 and HB.

Estimate Blood Pressure through PPG May 2021 - Jul 2021

- This project is to estimate blood pressure through PPG using deep learning model.
- Applying bandpass filter on PPG.
- Extract Garma Angular Field feature from PPG which is to convert 1-D time series signal to 2-D image.
- Construct channel-attention based CNN to predict blood pressure.
- Error of systolic blood pressure is sbout 8mm and Error of diastolic blood pressure is about 5mm.

Acoustic scene classification Dec 2019 - Aug 2020

- Acoustic scene classification is to classify Acoustic scenes into 10 catagories, such as bus, airport, metro, and metro station, etc.
- First, perform short time-frequency Fourier transform on audio signals. Secondly, perform histogram based noise estimation algorithm on time-frequency spectogram. Then, estimate Wiener- filter gain based on decision-directed method for audio enhancement. Next, do feature extraction, extract the feature as log-Mel spectrogram and perform mix-up data augmentation. Finally feed the enhanced audio into a deep learning network for classification.
- Modified network based on 'splited high and low frequency convolutional network' by combing with designed 'frequency attention'. Also with focal-loss being loss funtion instead of cross-entropy performs better.

- Improved the classification accuracy of 2020Dcase task1 from 54.1(baseline accuracy) to 60.3.

Device for measuring speed of running or walking in real-time Nov 2020 - Jul 2021

- This project aims to help people or professional athlete to measuring speed ,power, step frequency, stride etc, by designing a smart wearable device and fix it on shoe lace.
- (1)Compensate offset and sensitivity of sensors(2) foot stationary detection and zero velocity update. (3) Estimate pose attitude through quaternions which based on madgwick gradient descent complementary-filter algorithm.
- Our algorithm performance is comparable to the same type devices which is belived to be the best one across speed wearable sensors of all brands.

Measure R-R intervals Nov 2020 - Nov 2020

- This project aims to calculate R-R intervals and deployed on wearable senors.
- (1) Upsampling data (2)Perform PPG(photoplethysmographic) detection algorithm on interpolated data samples. (3) Calculate RR based on detected PPG onest indexes.
- This project written in C and simulated on keil.
- Will be deployed on 'Intelligent Bracelet' which is the product of company.

HONORS & AWARDS

Outstanding Academic Achievement Award 2019.5.17

SKILLS LIST

- C, Python, Matlab
- Keil, Keras
- git bash
- basic knowledge of computer networks, network architecture, and layers protocols and applications.
- familiar with classical Machine Learning algorithm (linear regression, Logistic regression, PCA, LDA, decision tree, Random forest, Naive Bayes, Gaussian Discriminant Analysis, etc.)

CERTIFICATIONS & OTHERS

- **Languages:** TOEFL: 99 GRE: 156+166
- **Certifications:** Piano Level 9 of China Music Association
- **Interests:** Basketball, watching NBA, fitness, piano

Github Link

https://github.com/syj1858/syj