마이다스아이티

PORTFOLIO

Profile

- Born in 25th, July, 1992
- I'm not shying away from my responsibility.
- Future hope : Financial AI Specialist
- Research Field : Medical, indoor location, Text emotion, Autonomous driving

- Received M.S degree in Electronic and electronics Engineering from Korea University, in 2019
- Received B.S degree in Information and Communication Engineering from Hankuk university of Foreign Studies

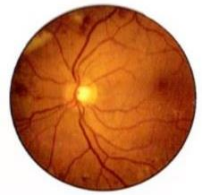
- My research interest include medical data preprocessing, indoor location awareness, machine and deep learning

R&D Competencies

- I have performed a sensor control, signal preprocessing, fin-tech, medical image processing, drone Autonomous driving and networking R&D for 2 years at Final Lab.

Laser sensor

Image/PIR sensor



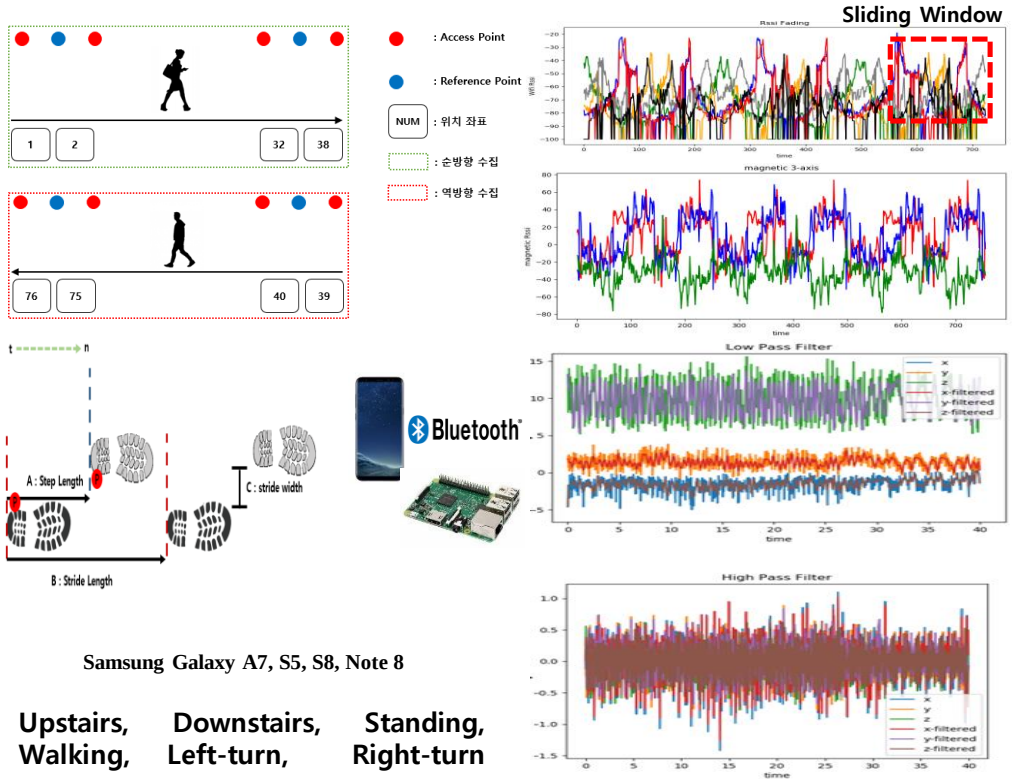
- Based on the data preprocessing knowledge, I have been researching on the analysis of time-series sensor signal using deep learning methods.
- My major research field is to analyze the data generated by time-series data through machine/deep learning method and apply them to practical applications.
- I solved the changing situation by applying AI algorithms to a wide range of areas.

Career Detail : Papers

Smartphone and PDR-based Indoor Localization (1/3)

- **Title** : Multi-Scale Deep Neural Network for Real-time Indoor Pedestrian Positioning System Using Smartphone
- **Thesis for a degree** : master student
- **Keyword** : **CNN, LSTM, BLSTM, Mobile Sensing, Human activity recognition**

(a) Data collection & Labeling with IMU sensor and Smartphone



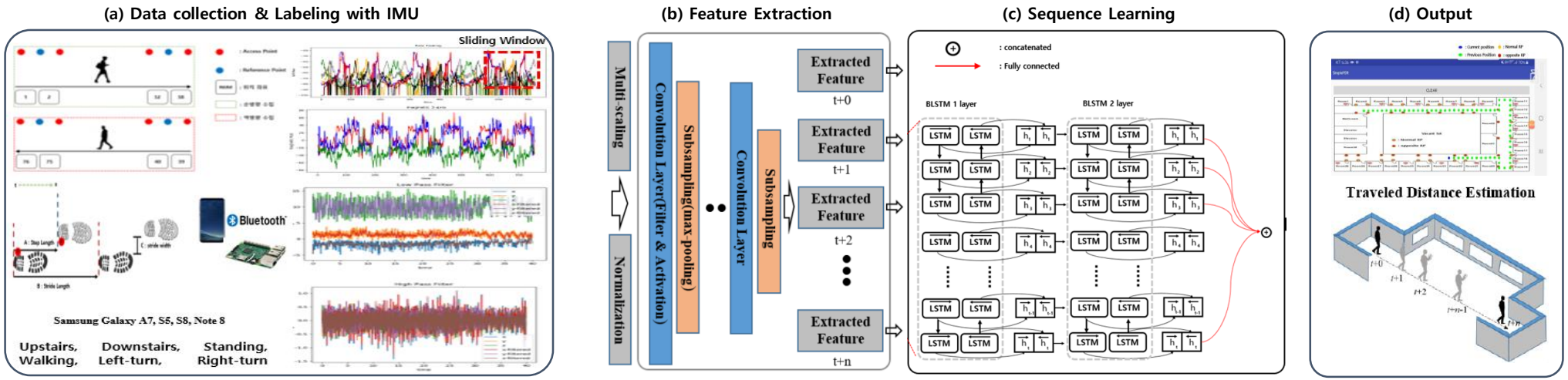
Samsung Galaxy A7, S5, S8, Note 8

Upstairs, Downstairs, Standing, Walking, Left-turn, Right-turn

- Wi-Fi data and magnetic field data used as landmarks were collected every two seconds.
- Pedestrian pattern estimation data is measured at 50 Hz using an IMU sensor embedded in the smartphone.
- Stride length estimation data were collected by labeling the distance values of IMU sensors embedded in the smartphone, using values received over the bluetooth between the smartphone and the Raspberry pi. **(stride length : 0.8, 0.7, 0.6, 0.35. 0)m**
- The gyroscope sensor is applied with HPF to prevent the problem of drift phenomenon that accumulates for long periods of noise and leaves as time passes even when conditions are constant.
- The acceleration sensor applied LPF to eliminate noise by reflecting the characteristics of good signal data in low frequency areas.

Career Detail : Papers

Smartphone and PDR-based Indoor Localization (2/3)

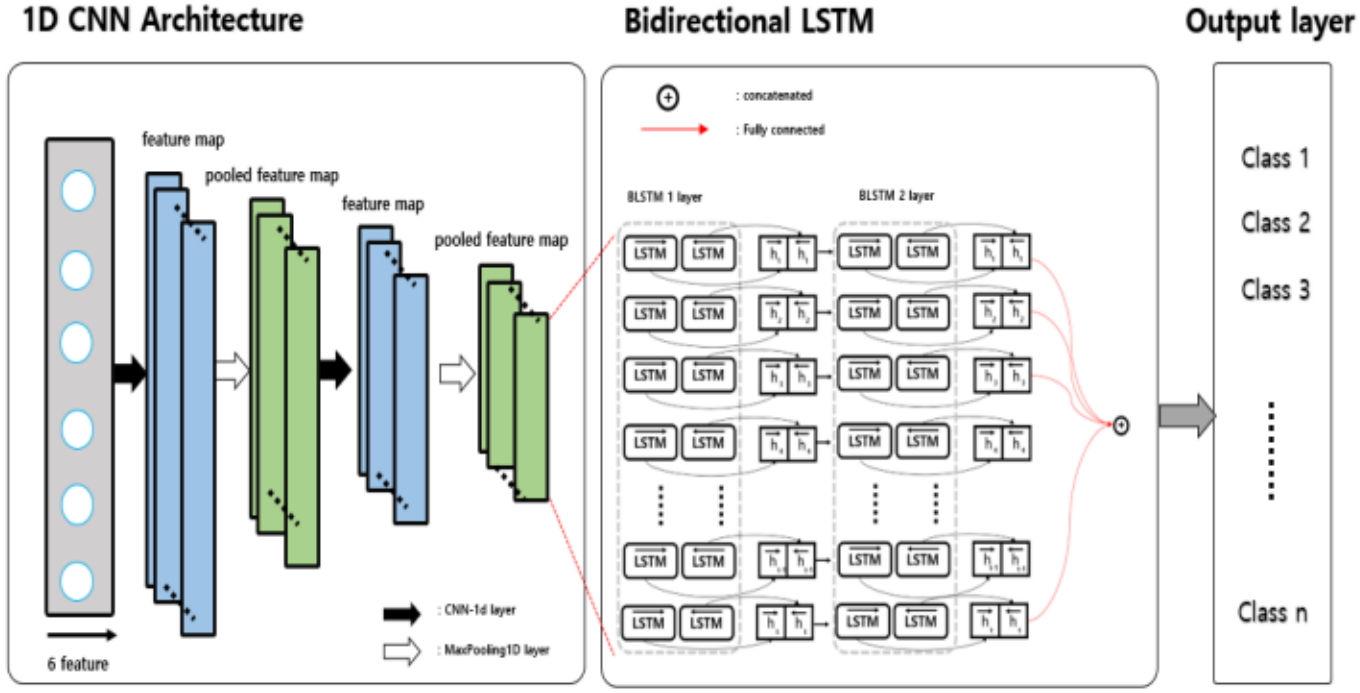


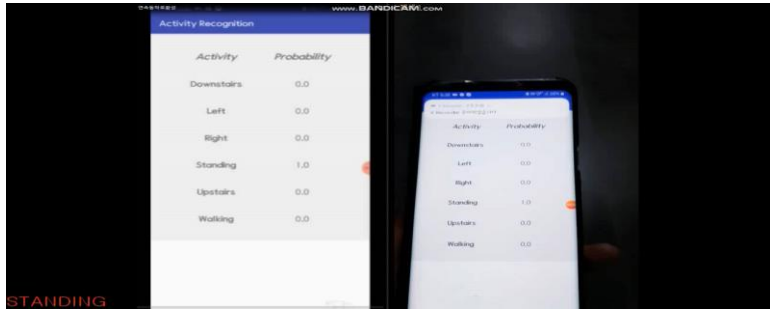
- Novel approach for indoor localization with own Smartphone by learning an individual gait pattern at indoor.
- No limitation on user and device diversity.
- Estimating an stride length of segmented IMU signal frames.
- End-to-end time-series signal classification model without any manually designed feature extraction as well as any domain or application specific analysis.
- Combination of multi-scaling method for simple noise rejection and trend of different time scale, CNNs for a nonlinear feature extraction, and RNNs for a temporal information
- Enhanced Bidirectional LSTM cell and model architecture for using multi-scaled inputs.
- This can be applied to finding lost children, indoor locations, etc.

Career Detail : Papers

Smartphone and PDR-based Indoor Localization (3/3)

- **Proposed multiscale and hierarchical CNN-RNN architecture for training and estimation of moving distance and activity from segmented and multi-scaled sensory signal**





- The transformed signals with different timescales are fed into corresponding CNN to extract feature vectors, and then each feature vector is fed into corresponding BLSTM cell as additional input.
- It is possible to estimate the location of pedestrians in motion indoors and can be estimated even when they are stationary.
- Wi-Fi RSSI and magnetic Landmark -> 97.62% Stride length -> 96.76% Pedestrian pattern -> 95.2%

Career Detail : Projects

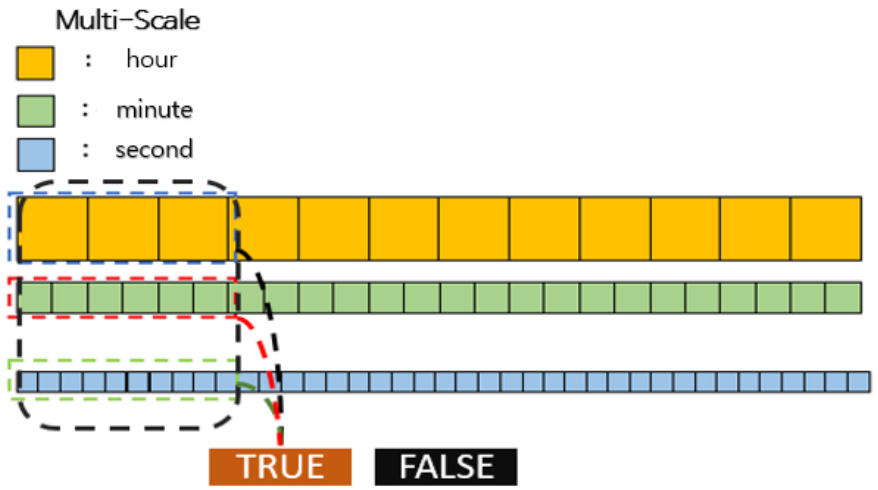
Daou and Kiwoom Fintech Solution Proposal Project(1/2)

- **Intentions** : personal project
- **Keyword** : **Bitcoin predict, CNN 1D, LSTM**

(a) Input data : bitcoin + Gold price

Open	High	low	close			Gold price	LABEL
1							True
2							False
3				●●●			True
4							False
5							True
6							False

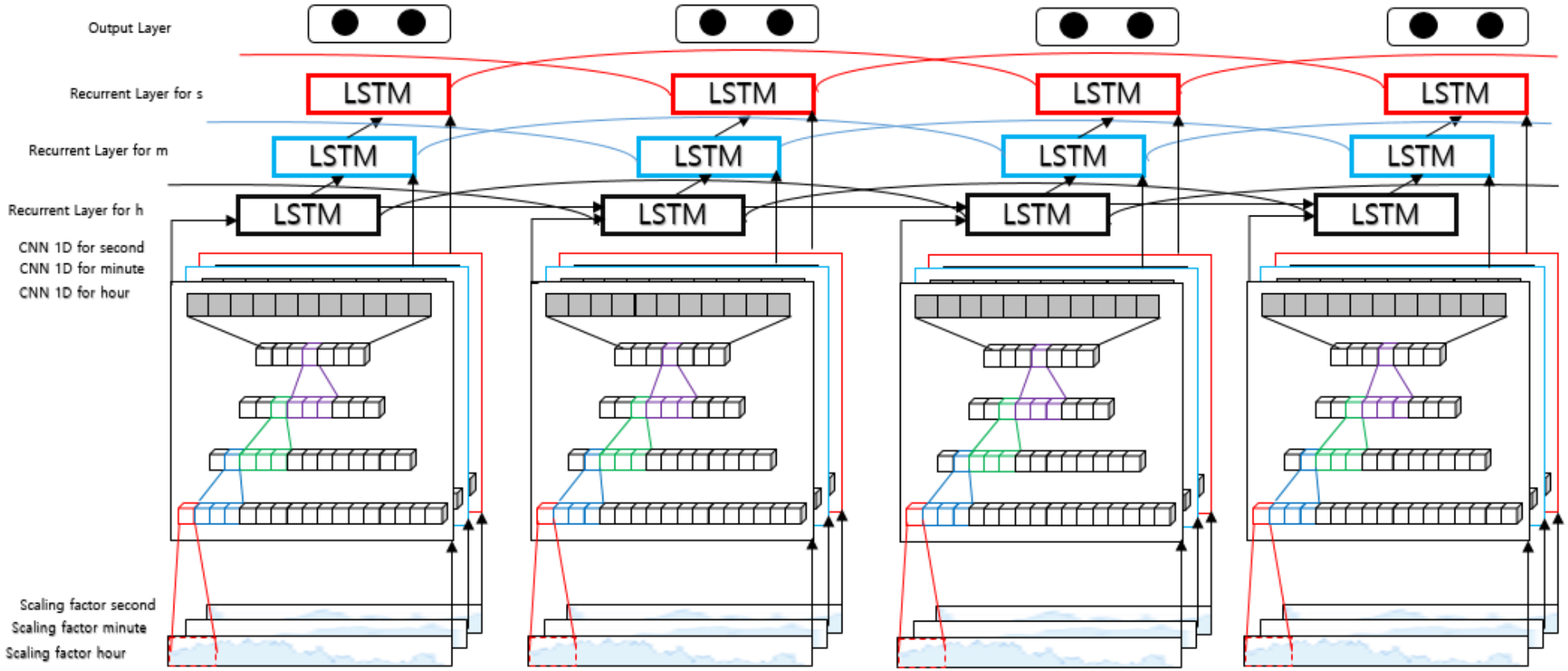
(b) Input data : Hour, Minute, Second



- **Bitcoin and gold have properties as substitutes for money.**
  - Bitcoin : Market price, high price, low price, closing price, volume, market cap, change rate, estimated value
  - Gold : Market price, high price, low price, estimated value, change
- The transformed signals with different timescales are fed into corresponding CNN to extract feature vectors

Career Detail : Projects

Daou and Kiwoom Fintech Solution Proposal Project(2/2)



- The transformed signals with different timescales are fed into corresponding CNN to extract feature vectors, and then each feature vector is fed into corresponding LSTM cell as additional input.
- K-fold evaluate

Average **74.375 ± 3.32** % **Best Case** **77.695** % **Worst Case** : **71.055** %