Live sensor demo (media link)  flat on the table , texting  ( answer a phone call ) , place in pocket

Device mode (and pedestrian mode) as one of the sensor based dead-reckoning problems

***Fig 10 from "A Multy-Mode Dead Reckoning system for pedestrian tracking using smartphone*- single mode tracking results**

Time constraint -  what we try to achieve in less then 2  month  ( excluding holidays... )

Classification tasks : 1. device mode , 2. pedestrian mode

Data collection strategy - search similar projects in "Kaggle" ( show what we found ) , in-house data collection (doesn't ice-cream is a decent incentive  ? ) .

Data set description  - train, test , validation portions .  device mode label , pedestrian mode label

Classic ML (feature engineering ) vs DL approach

Classic ML features : g-force / gyro norm.  sliding window min max max-min average  median variance , peaks , frequencies ...

Features plots from notebook : gyro-norm (t)  , g-forc-norm(t)  average-gyro-norm(t)

**Features correlation matrix chart**

Classic ML results : KFold Cross-validation : what happens when samples from the same recording session spread between the train and validation data (99.9 % accuracy with knn)

KNN, RandomForest, multi-class SVN

**Show 99.9 accuracy results and explain group based KFold splitting**

Show preliminary results using KNN vs RandomForest vs SVN

Parameters tuning :

       window size , window shape ( triangle Gaussian , others )  impacts , time based window  ,

      SVN / Random Forest parameters optimization using grid search method.

Remove out layers  process (KFold with fold for each file - finding the suspects )

Show Final results :

Pedestrian mode classification - using Samsung data base

deep learning approach  : using 1D Convolution layer ( if we have enough time and enough data)

Online Demo on transmitted sensor data (Live or video clip )

***Thanks***

hooks :

How did I got here ? Join a cool project and in return give a lecture in a  tiny technical forum...

The proof that **Deep** **learning** is now everywhere - it sneaks into the lectures program  (wasn't in the abstract ... )

It's a bad practice to quote the presentation as is from the screen - so we put it in English to make sure I would not read it...

Someone told me to insert spelling errors in the slides , for those who must have comments ...

Credits :

Guy

Data collection volunteers

Bibliography :

A Multy-Mode Dead Reckoning system for pedestrian tracking using smartphone -