ベンチャー体験工房3

Developing a Novel Pattern Mining Model to Discover Hidden Patterns in Fukushima Traffic Congestion Big Data

- **Building Traffic Congestion Prediction Models for Large-Scale Transportation Networks**
- **Exploring Pattern Discovery in timeseries**

担当教員：RAGE Uday Kiran

概 要

- Japan Road Transportation Information Center (JARTIC) has set up the sensor network to monitor traffic congestion in Fukushima.

- Each road-segment in this network generates data at every 5-minute interval.

- Previous year, we have developed a data warehouse technology that generates data frames at 10 times faster than the state-of-the-art.

- This year, we plan to develop a multitask learning algorithm and a novel pattern algorithm to discover hidden traffic congestion patterns.

実 例

collected traffic data

Traffic congestion dataset

Time	Road 1	Road 2	$\cdots$	Road k
t_1	100	56	$\cdots$	156
t_2	17	36	$\cdots$	45
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
t_n	39	67	$\cdots$	81

$\{TS_1, TS_2, \ldots, TS_k\}$

$\{TS_1\}$

$J(W, b)$ LSTM shared

$\{TS_2\}$

$J(W, b)$ LSTM shared

$\{TS_k\}$

MTL-LSTM Traffic Congestion Prediction Model

$\{TS_1^{Pr}, TS_2^{Pr}, \ldots, TS_k^{Pr}\}$

Predicted traffic congestion

Time	Road 1	Road 2	$\cdots$	Road k
t_{n+1}	96	59	$\cdots$	156
t_{n+2}	37	47	$\cdots$	78
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
t_{n+k}	35	62	$\cdots$	67

$\{tr_1^{Pr}, tr_2^{Pr}, \ldots, tr_k^{Pr}\}$

Estimated traffic congestion on road network