

IVT – Seminar [Oct. 20, 2017]

Big data: Results from Japan

Introduction

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Overview of TokyoTech.

1881 Founded as Tokyo Technical School

1929 Elevated to a degree-conferring university as
Tokyo Kogyo Daigaku (Tokyo Institute of Technology)

2004 Reorganized as an independent administrative institution,
National University Corporation Tokyo Institute of Technology

As of May 1, 2017	Number of Students and Staffs (rounded)
Undergraduate (International)	4,800 190
Graduate (International)	5,100 910
Research Students	100
Academic Staff	1,100
Administrative Staff	480

Transport Studies Unit (TSU) @ TokyoTech

Staffs

Prof. Yasuo ASAKURA

Prof. Tetsuo YAI

Assoc. Prof. Yasunori MUROMACHI

Assoc. Prof. Shinya HANAOKA

Assoc. Prof. Daisuke FUKUDA

Assist. Prof. Aataru NAKANISHI

Assist. Prof. Tomoya KAWASAKI

Students

12 Undergraduate (B4) students

>40 MSc. Students

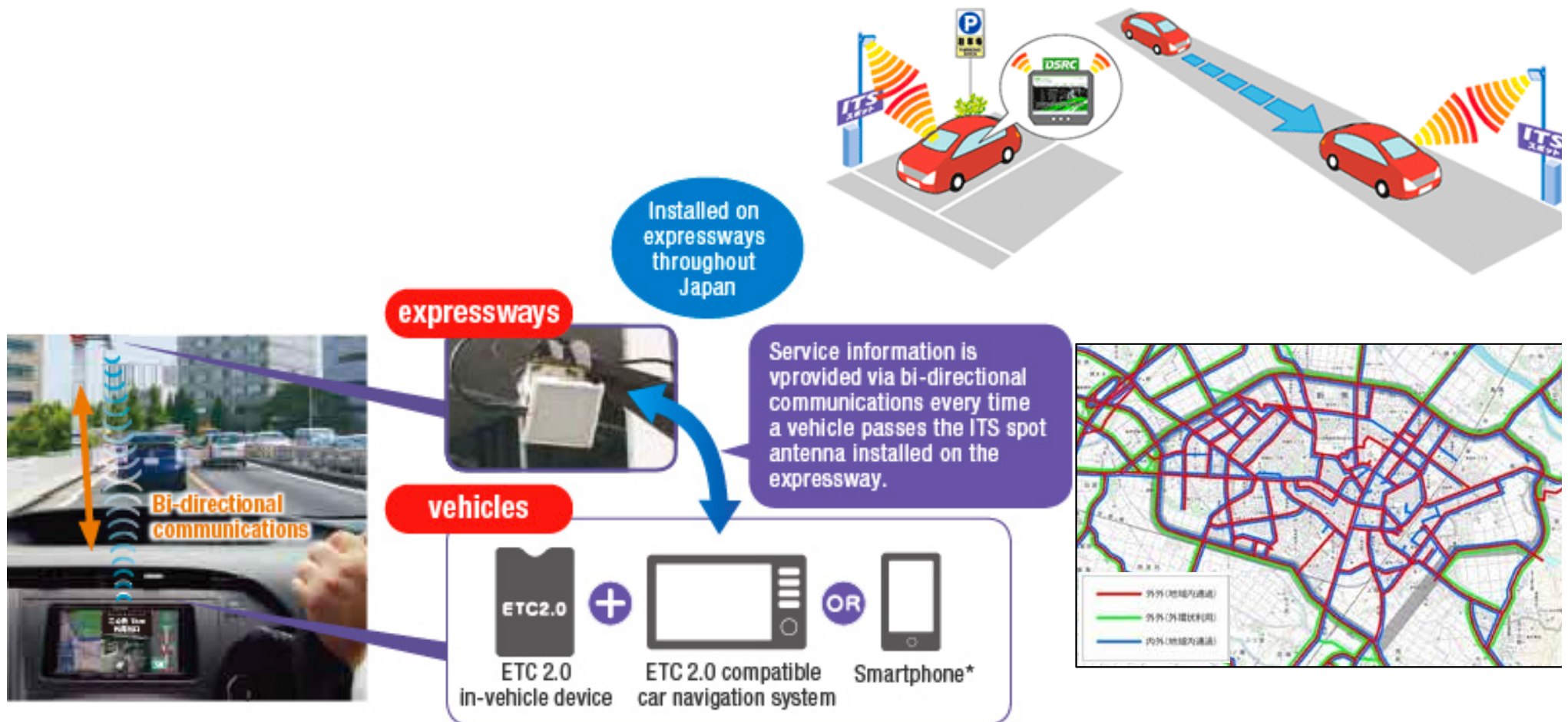
15 Ph.D. Students

<http://transport-titech.jp/>



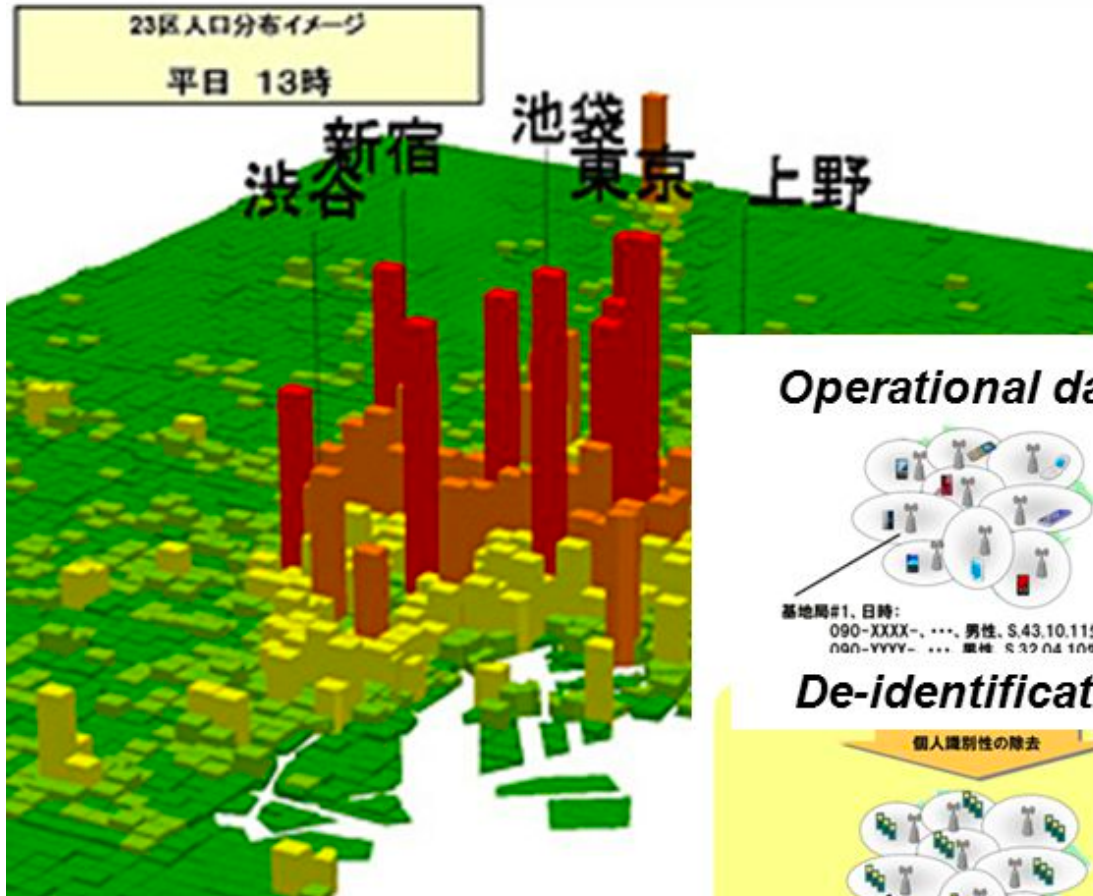
Big Data 1: Electronic Toll Collection Version 2.0 (ETC 2.0) Probe Data

- Information services provided on ETC 2.0 are automatically transmitted from ITS spots located on expressways or arterial roads to vehicles.
- There are about 1,600 ITS spots installed throughout the nationwide expressways, and new information is sent every time a car passes by an ITS spot.



Big Data 2: Mobile Spatial Statistics

モバイル空間統計イメージ：東京23区周辺の人口分布



The smallest size: 500m * 500m

Operational data



基地局#1, 日時:
090-XXXX-, ..., 男性, S.43.10.11生,
090-YYYY-, ..., 男性, S.32.04.10生,

De-identification

個人識別性の除去



基地局#1, 日時:
男性, 40歳台,
男性, 50歳台,
....

個人識別性のないデータ

Mobile Spatial Statistics

(40歳台男性)

75人	120人	30人
90人	135人	105人
45人	60人	データ無し

Aggregation

秘匿処理

Privilege

(40歳台男性)

75人	120人	30人
90人	135人	105人
45人	60人	6人

Aggregated population

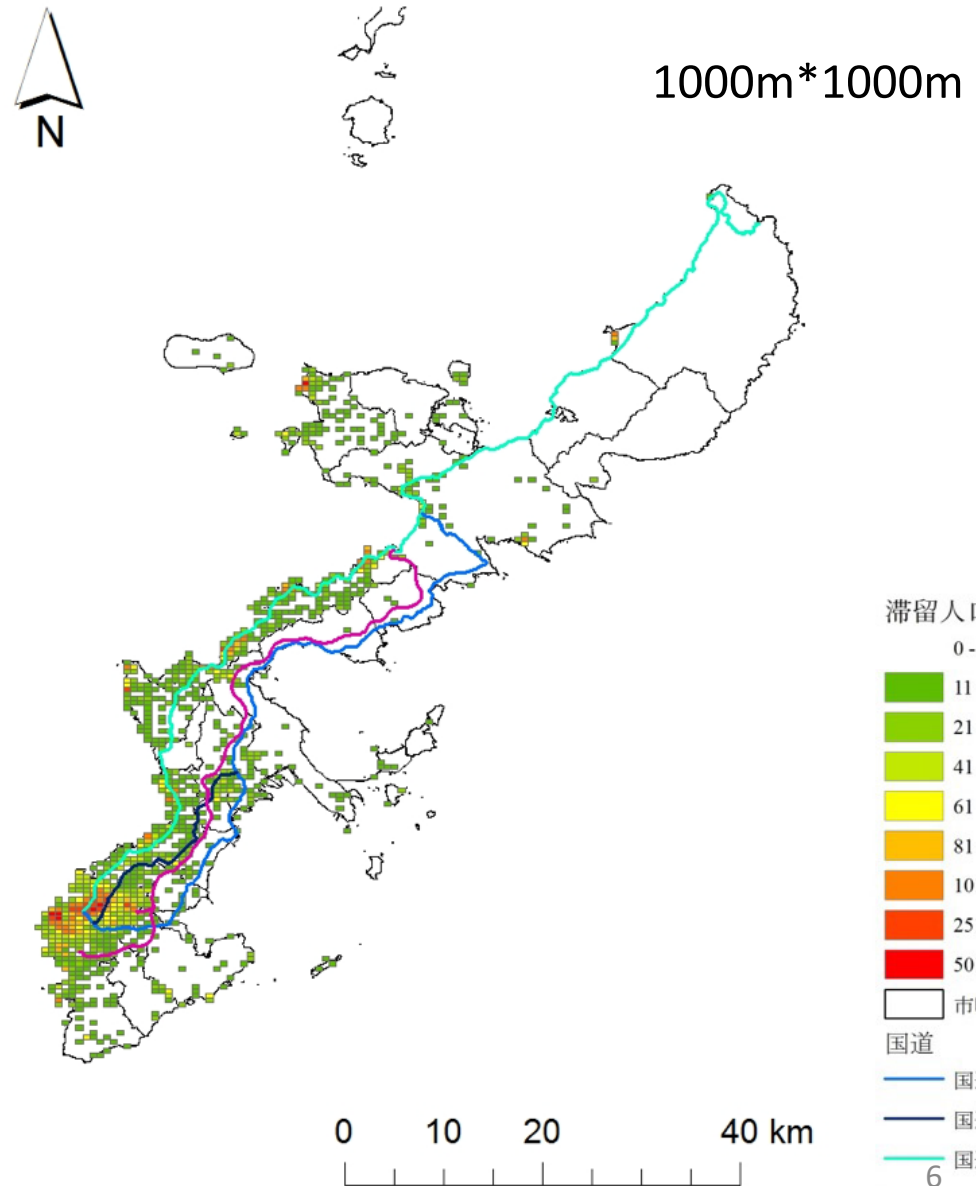
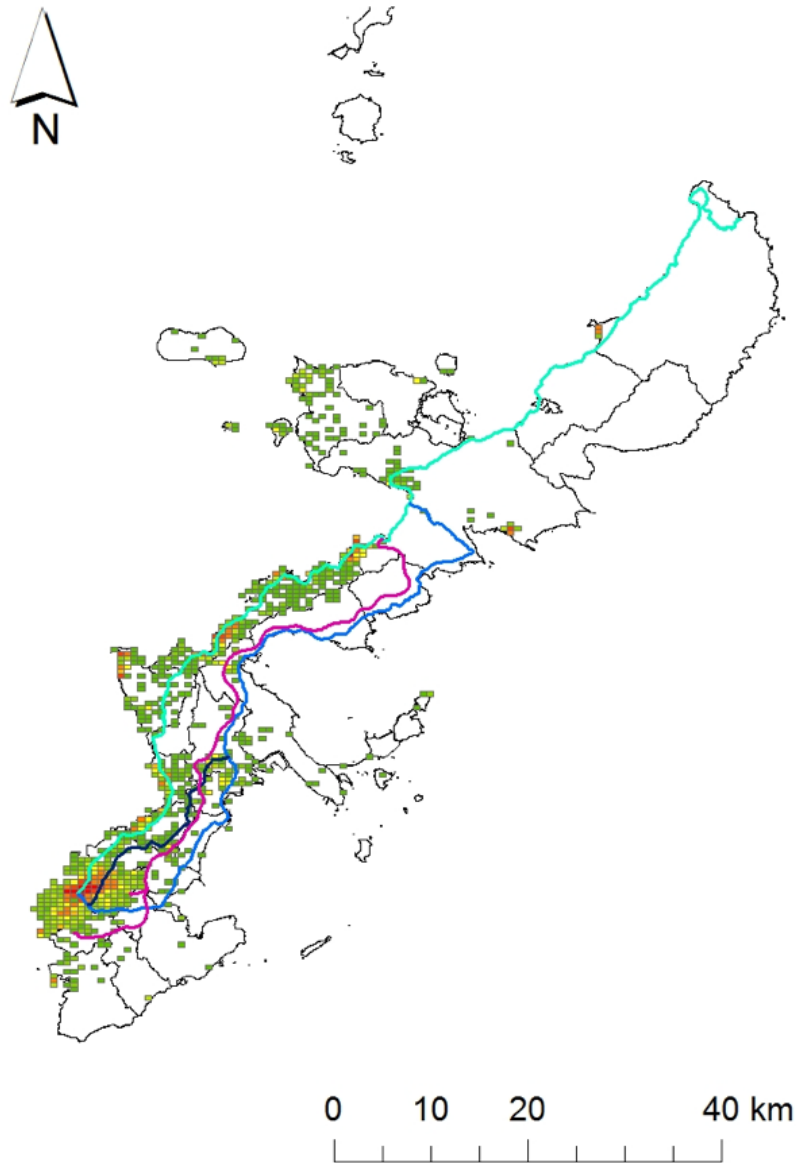
Mobile Spatial Statistics (From NTTDocomo web site:

http://www.nttdocomo.co.jp/corporate/disclosure/mobile_spatial_statistics/)

Tourist Distribution in Okinawa-main Island

Aug. 27, 2016 (Sat.) AM4:00-5:00

Aug. 27, 2016 (Sat.) AM10:00-11:00



Big Data (Others)

- Monitoring of Wi-Fi probe request from each smartphone.

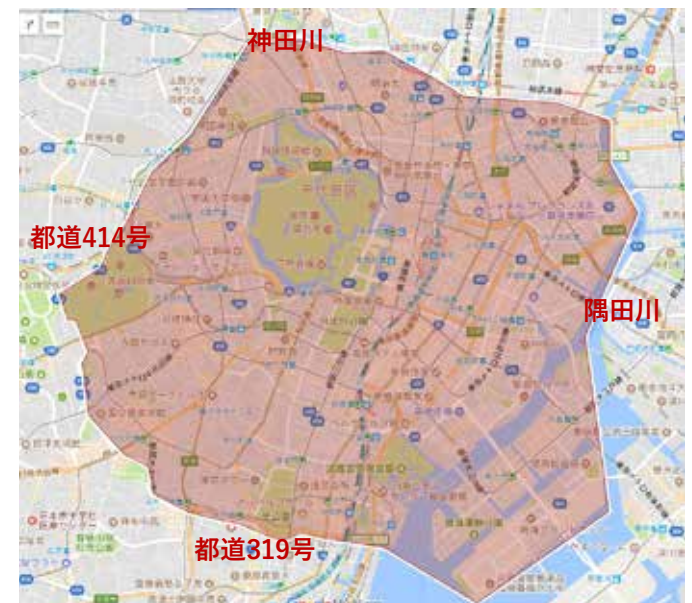
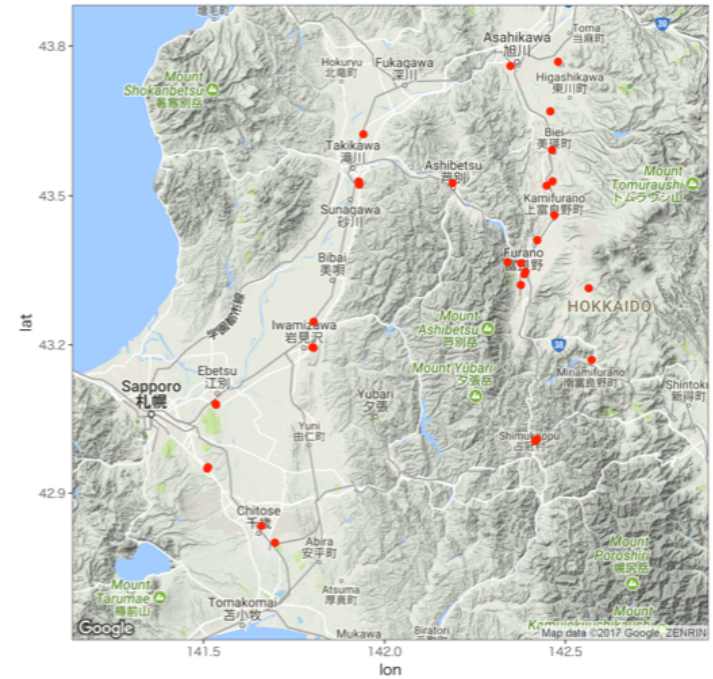
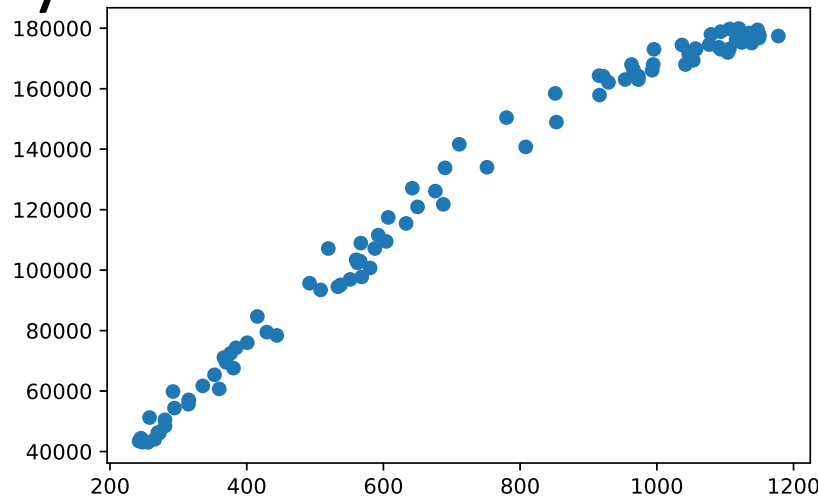


← Probe Request(PR)
at regular intervals



Wi-Fi [ON]

- Detector data (>2200 points) in CBD, Tokyo



Today's Presentations

1. Noriko Kaneko, (ETH Zurich & TokyoTech.)
"A Recursive Logit Route Choice Model Considering Link Perceptions with An Application to Tokyo"
2. Arata Suzuki, (TokyoTech.)
"Data-Fusion Approach for Trip-Purpose Estimation of Inter-Regional Passengers"
3. Hiromichi Yamaguchi (University of Kanazawa)
"Direct and Indirect Effects of New High Speed Rail Service: An Empirical Analysis Using Japanese Mobile Phone Location Data"