A Deep Learning model for Predicting Traffic Conditions using GPS Bus Data

Smart TrafficHub / Älypysäkki

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Tampere University

Overview

- Predicting traffic conditions based on GPS Bus Data
- Predicting availability of bus lines based on historical information of occupation
- Predict individual boarding and alighting locations based on smart card data

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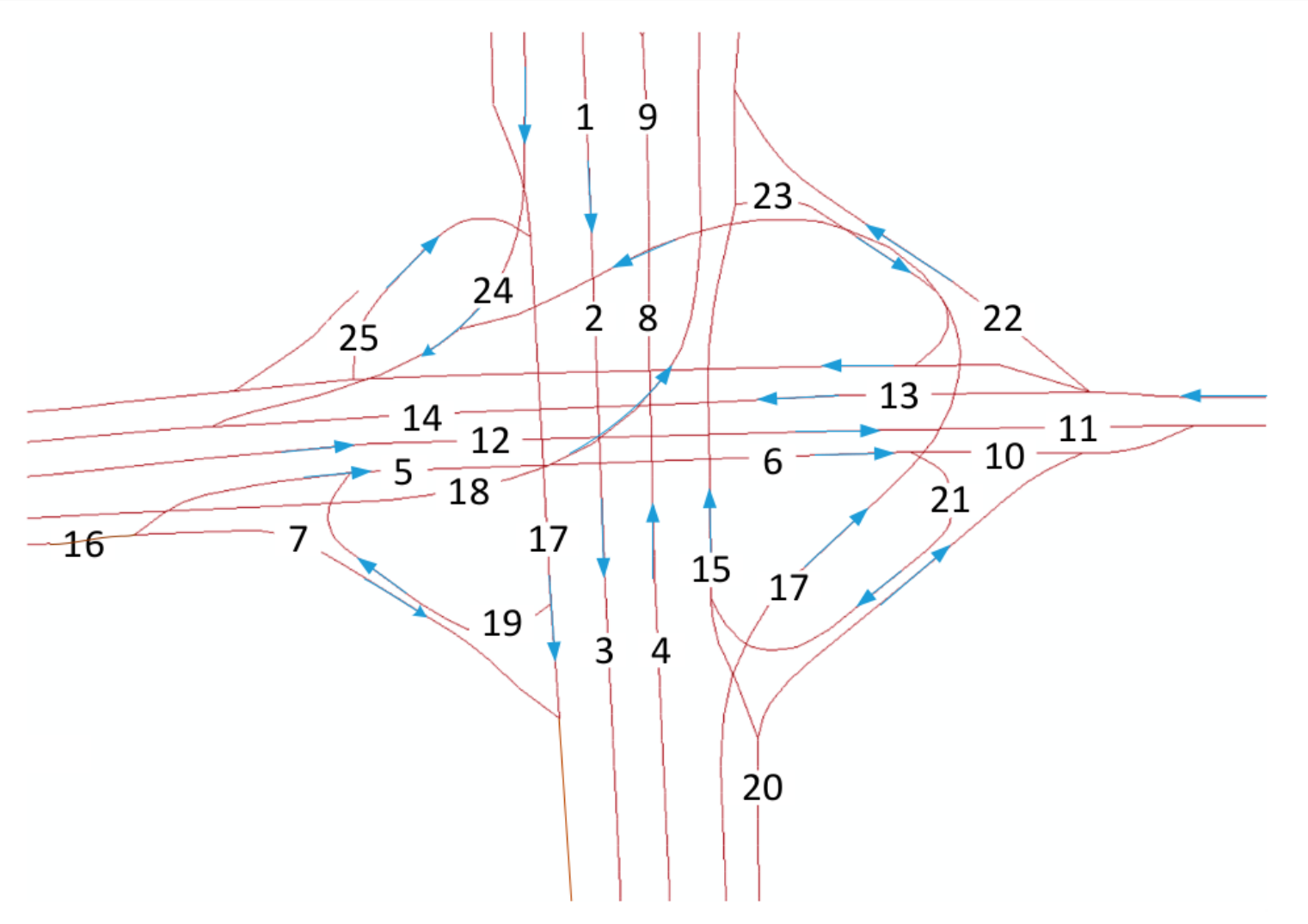
Goal

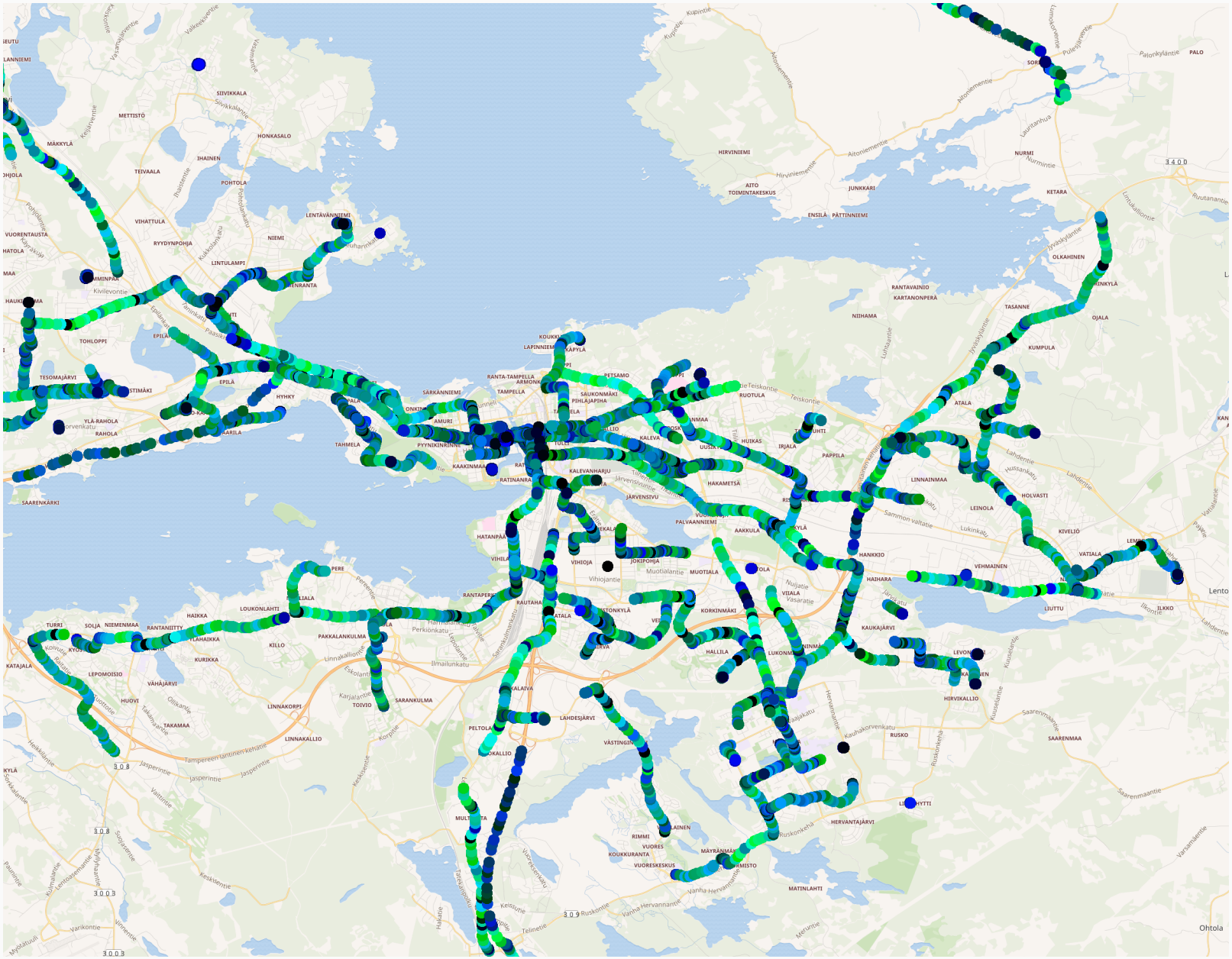
Goals

- Spatiotemporal dependency, capturing distant and causal effects

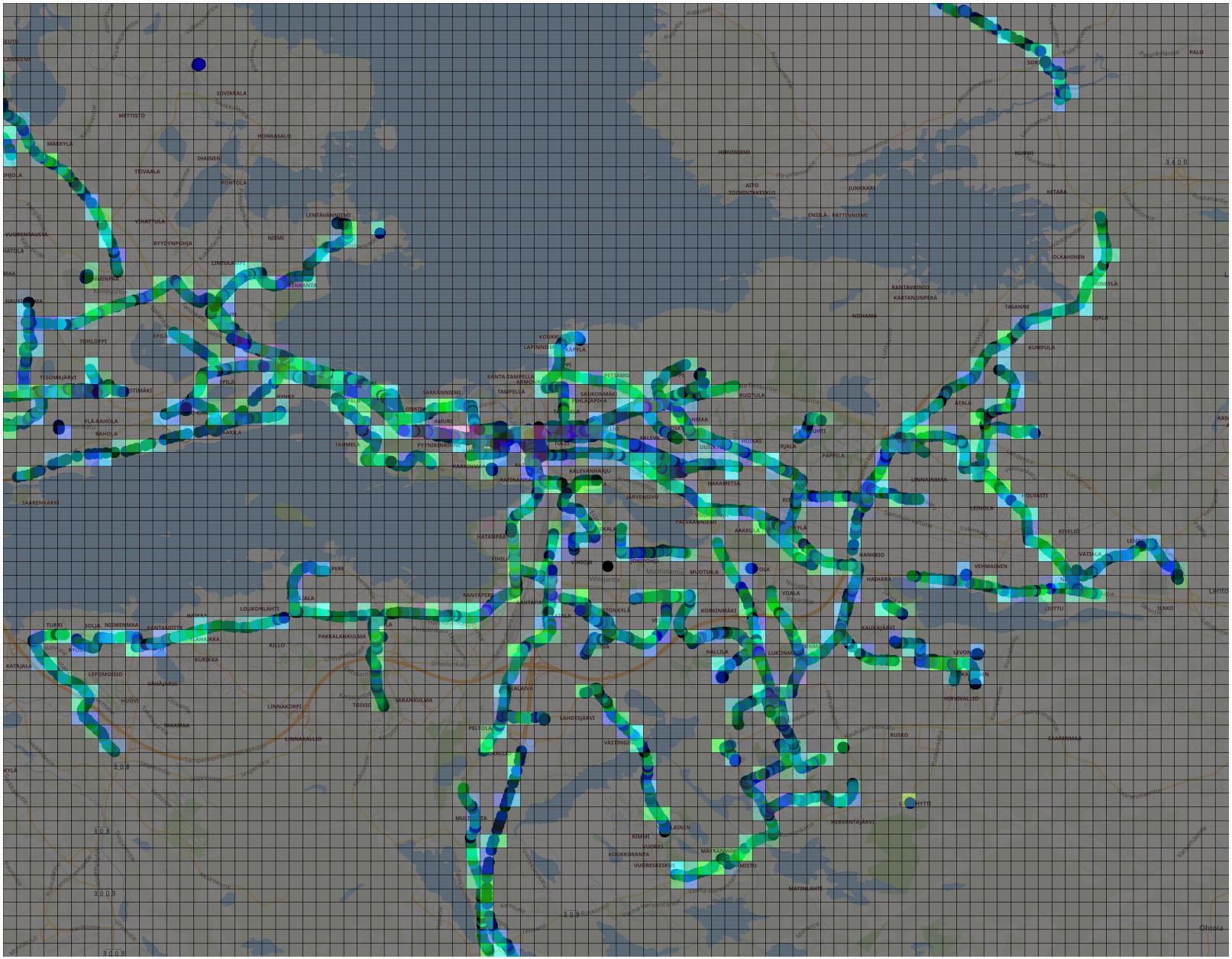


Data Preparation

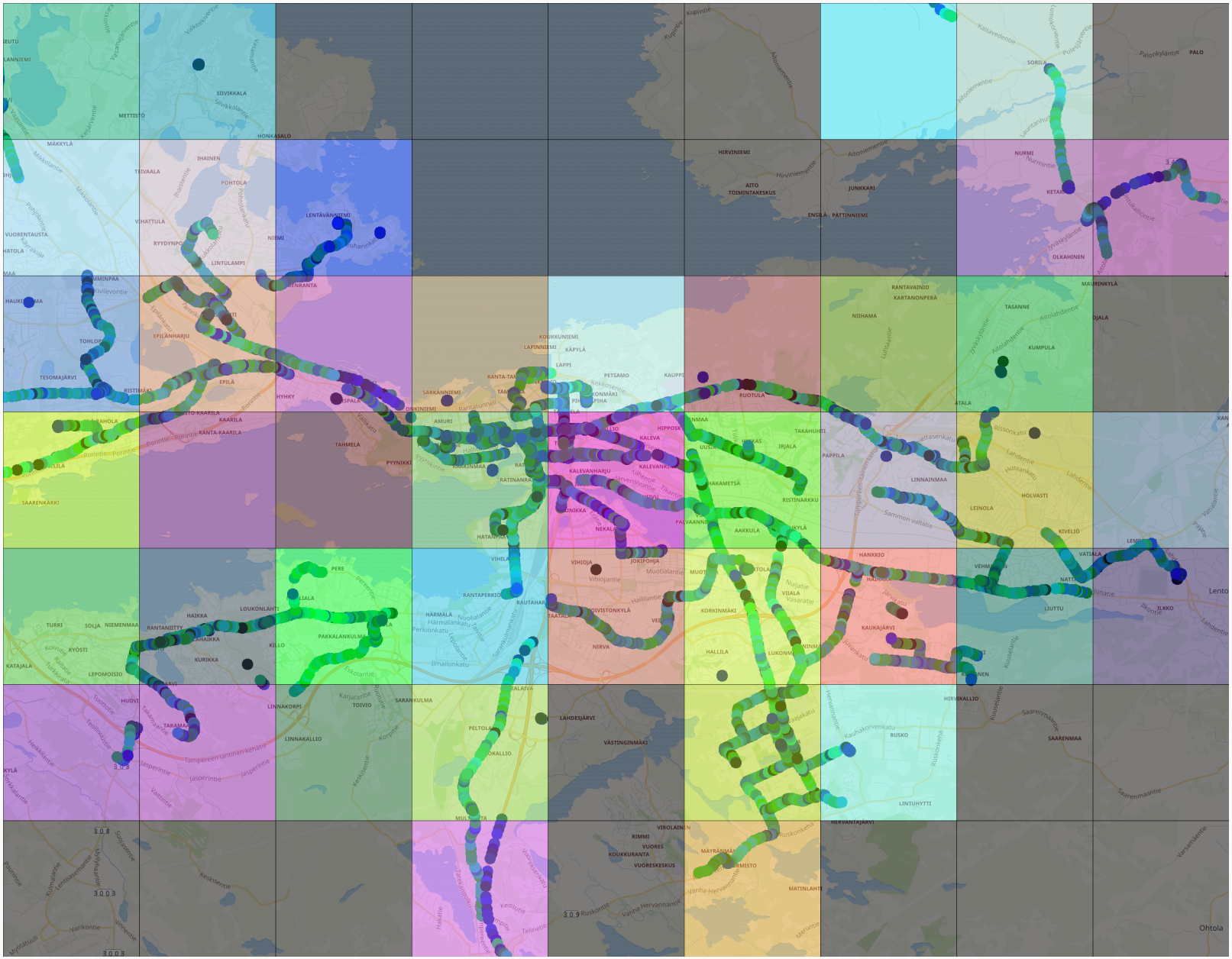
GPS Data - 5 minutes interval



GPS Data - 5 minutes interval (input)

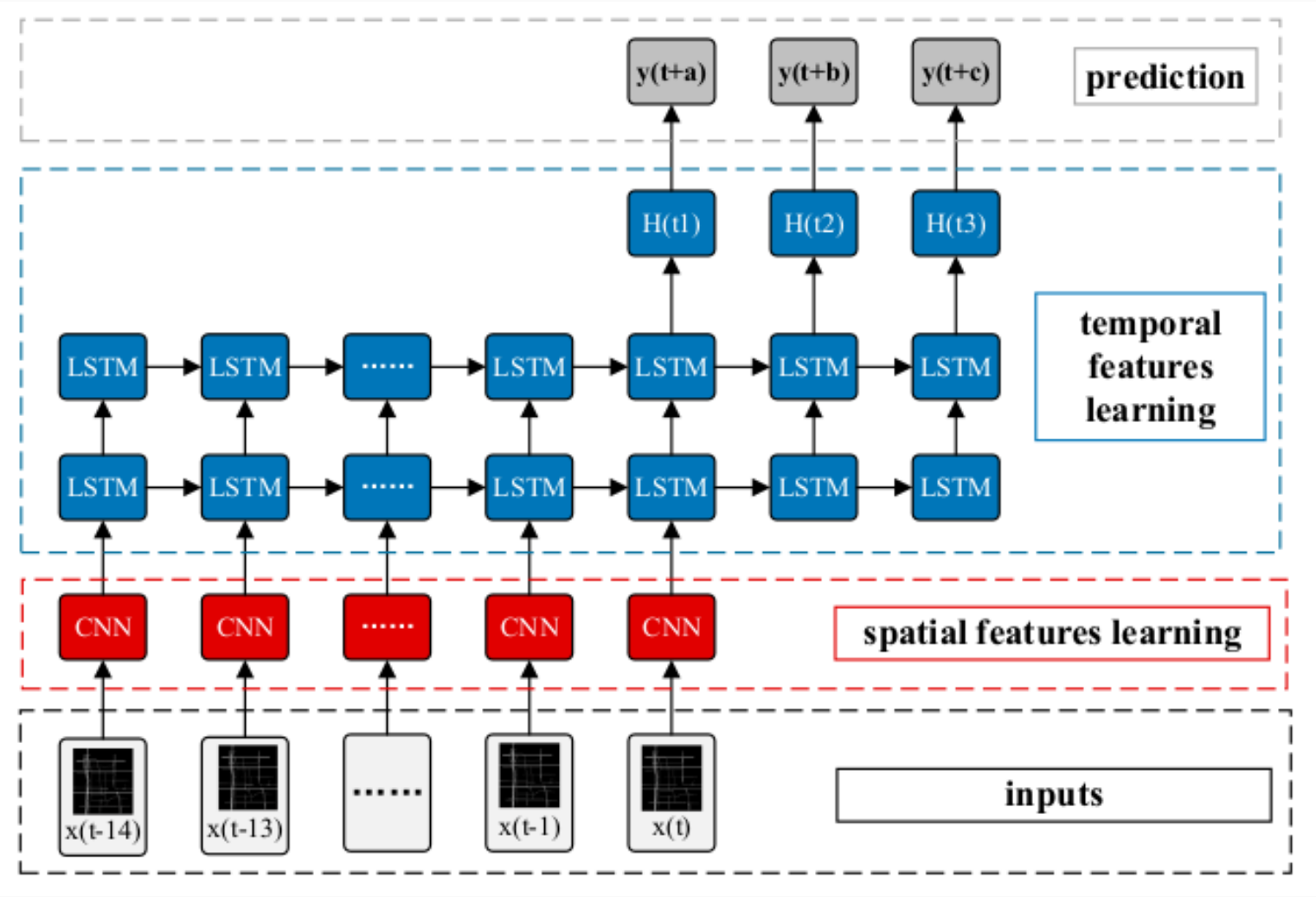

TAMPERE
HERVANTAJÄRVI
KAUKAJÄRVI
LAHDESJÄRVI
VEHMAINEN
HALLILA
KALEVANHARJU
HÄRMÄLÄNRANTA
KOIVISTO
PEITOLA
VIHIOJA
MUOTIALA
KOIVUKYLÄ
KORKINMÄKI
HÄRMÄ
KAUPPI
KEKOLA
KALEVA
HATANPÄÄ
TAMMELA
PYYNIKINRINNE
KAARINA
RATINAN
JÄRVENSIVU
PÄIVÄRANTA
AAKKULA
HAKAMETSA
LINNAINMAA
PAPPILA
RISTOLA
LEINOLA
KIVELIÖ
VATIALA
HANNIKKO
HAIHARA
VIIALA
LIUTTU
IKKO
LEVON
HIRVIKALLIO
RUSKO
KLAUKKALA
VÄSTINKI
PEITOLA
SARANKULMA
TOIVIO
LINNAKALLIO
LINNAKORPI
PAKKALANKULMA
KILLO
KURKIKKA
LEPOMOISIO
VAHAJÄRVI
HUJOVI
TAKAMAA
LOUKONLAHTI
HAUKKA
TURKI
SOLJA
NIEMENMAA
RANTAMIITTY
VILAHAKKA
KATRIALA
SAARENKARKI
YLÄ-RAHOLA
RAHOLA
TISOMAJÄRVI
TOHLOPPI
KYLÄMÄKI
VIHATTULA
TEIVAALA
MÄKKYLÄ
SIIVIKKALA
METTISTÖ
IHAINEN
HONKASALO
POHTOLA
RYYGYNPOHJA
NIEMI
LENTOKENTÄNRANTA
LENTÄVÄNNIEMI
LINTULAHTI
KOIVUKYLÄ
LAPINNIEMI
KAPYLÄ
RANTA-TAMPELLA
ARMONLAHTI
TAMPELLIA
SARKÄNNIEMI
OSKIDA
AMURI
SAUKONMÄKI
PÖHLÄJÄPIHA
PETSAMO
RUOTULA
ATALA
UUSKYLÄ
ORJALA
KALEVANHARJU
RATINANRANTA
HERVIS
HERVIS
HERVIS

GPS Data - 5 minutes interval (prediction)



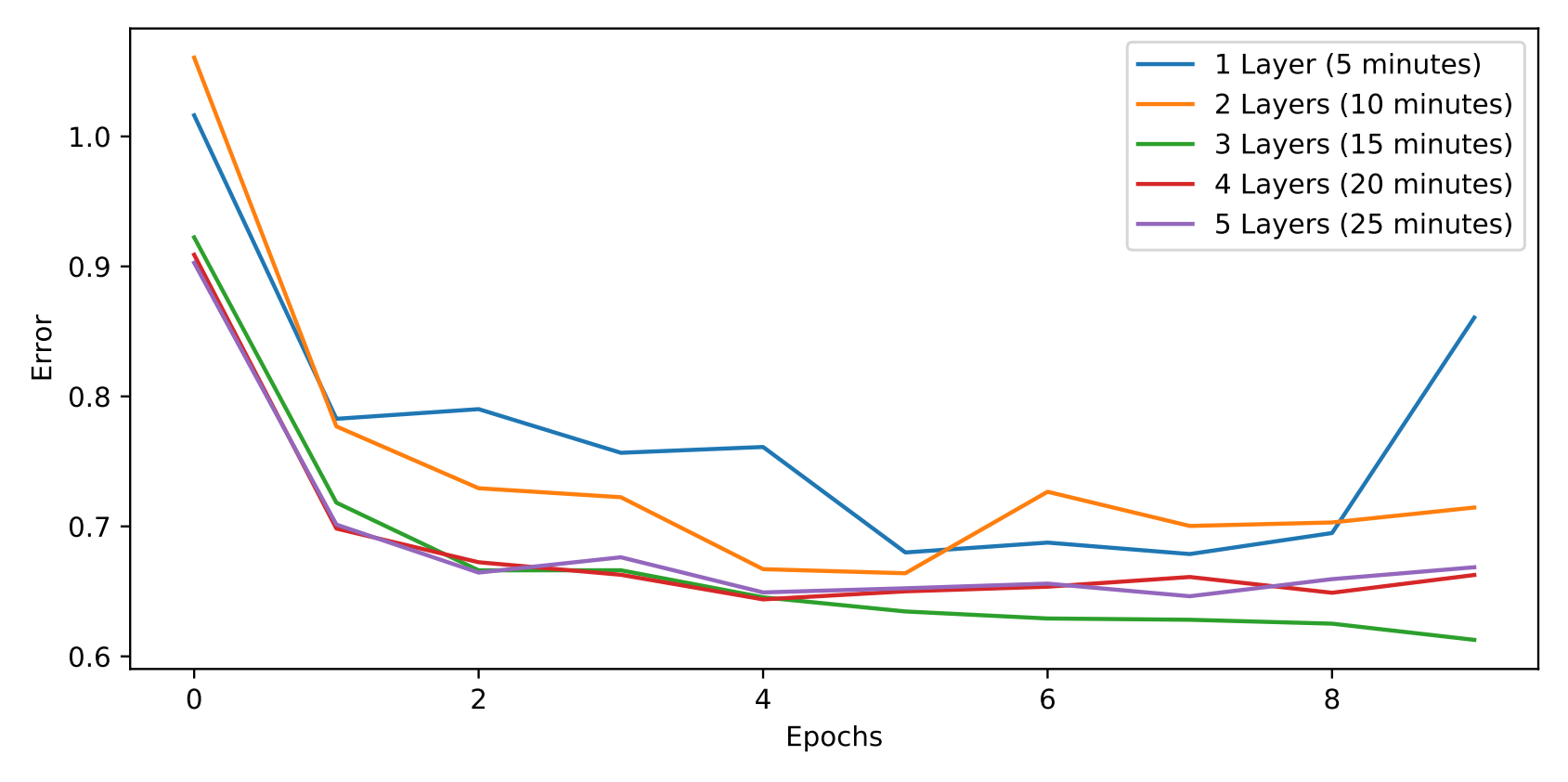
Model

GPS Data



(Yu, H. et al. "Spatiotemporal Recurrent Convolutional Networks for Traffic Prediction in Transportation Networks." Sensors 17 (2017))

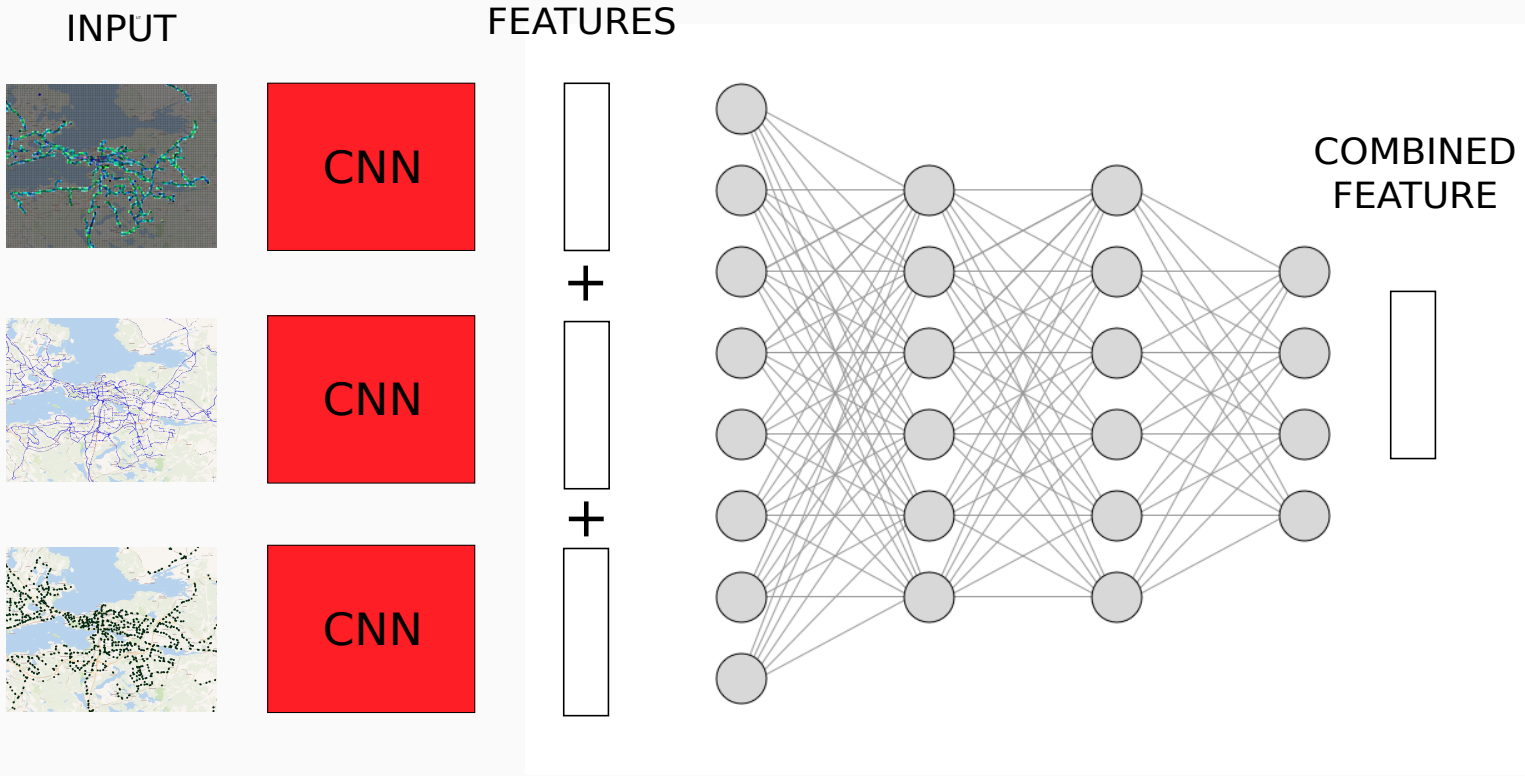
First Results



Future Works

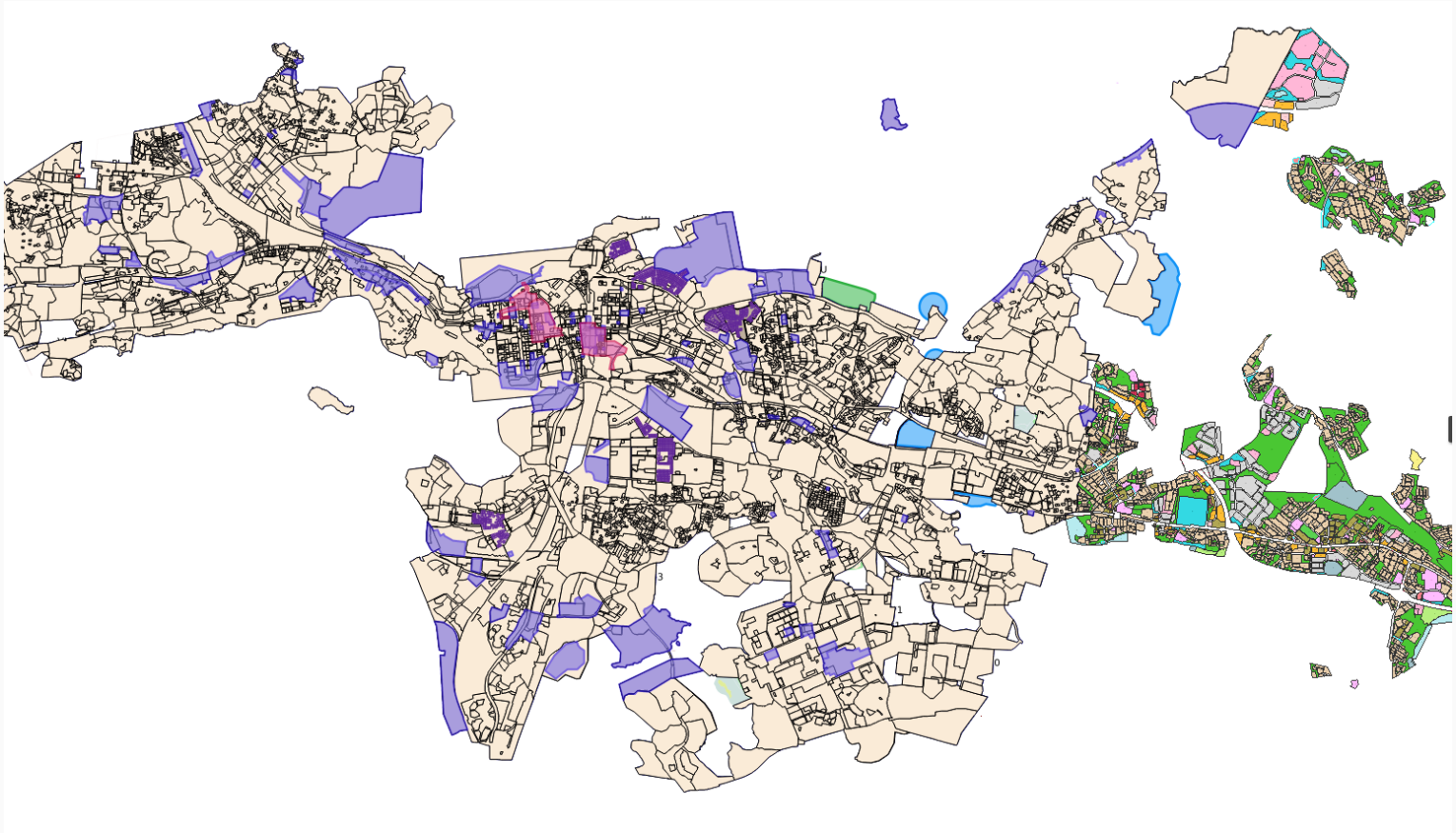
Data integration

- Combine long and short term memory
- Combine dynamic inputs like weather, humidity, sensors...



Prediction Shapes

- Complex shapes instead of regular grids



Thank you! Questions?

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