AIPARK

Artificial Intelligence Based Parking

Finding open parking spots with Big Traffic Data and AI

Urban Mobility Challenges - 11/2017

Outline

Parking = Thrills

Parking = Huge market

$43 Bil.

Smart Parking

Applications annual market volume 2025, worldwide

(Frost & Sullivan 2015)

56 %

Advanced Navigation

annual market growth until 2021, worldwide

(Statista 2017)

$59 Bil.

Traffic Management

Systems annual market volume 2022, worldwide

(Markets And Markets 2017)

Parking = Annoying

Because drivers have

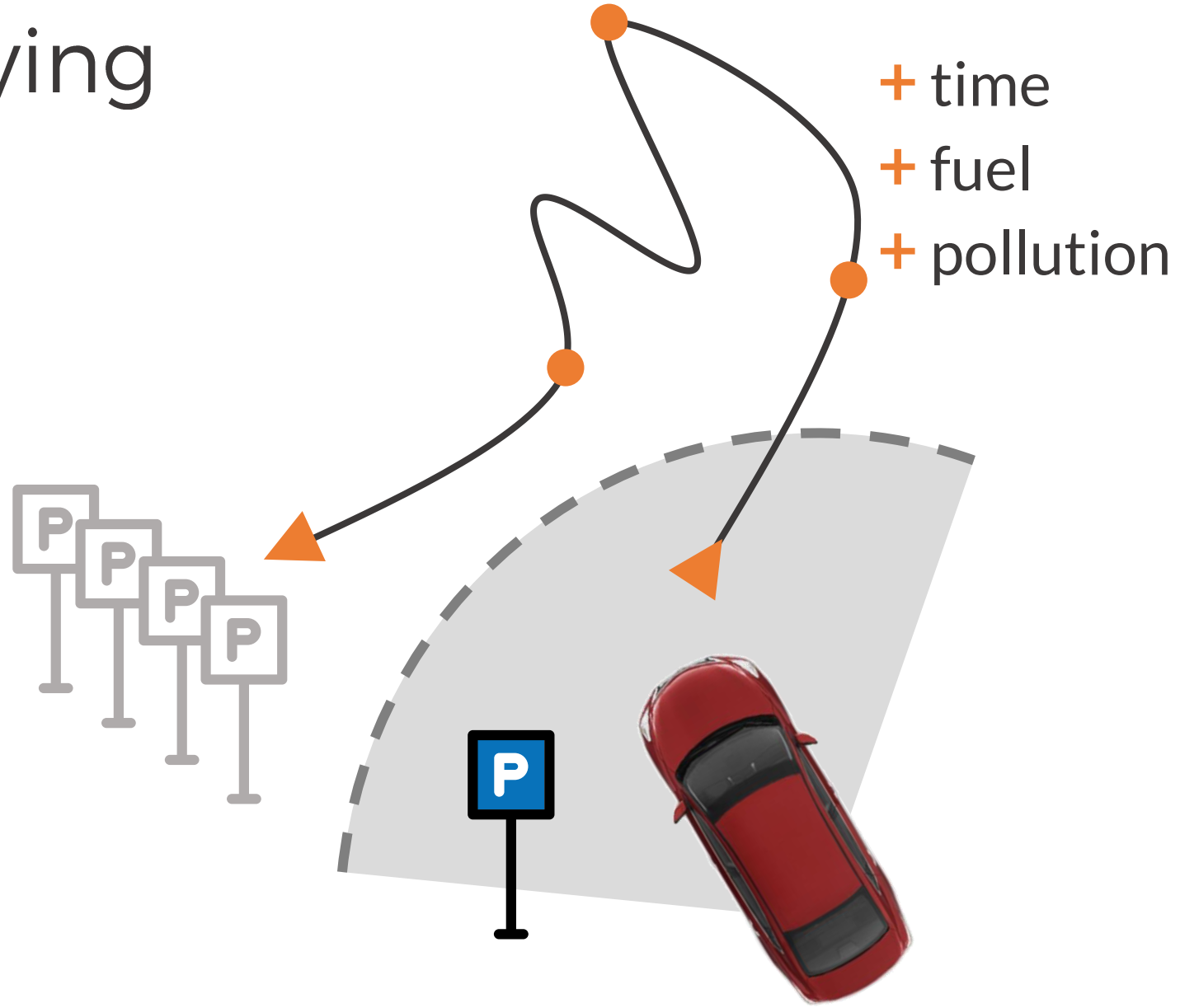
Insufficient information

Parking locations ?

Availability ?

Prices ?

Restrictions ?



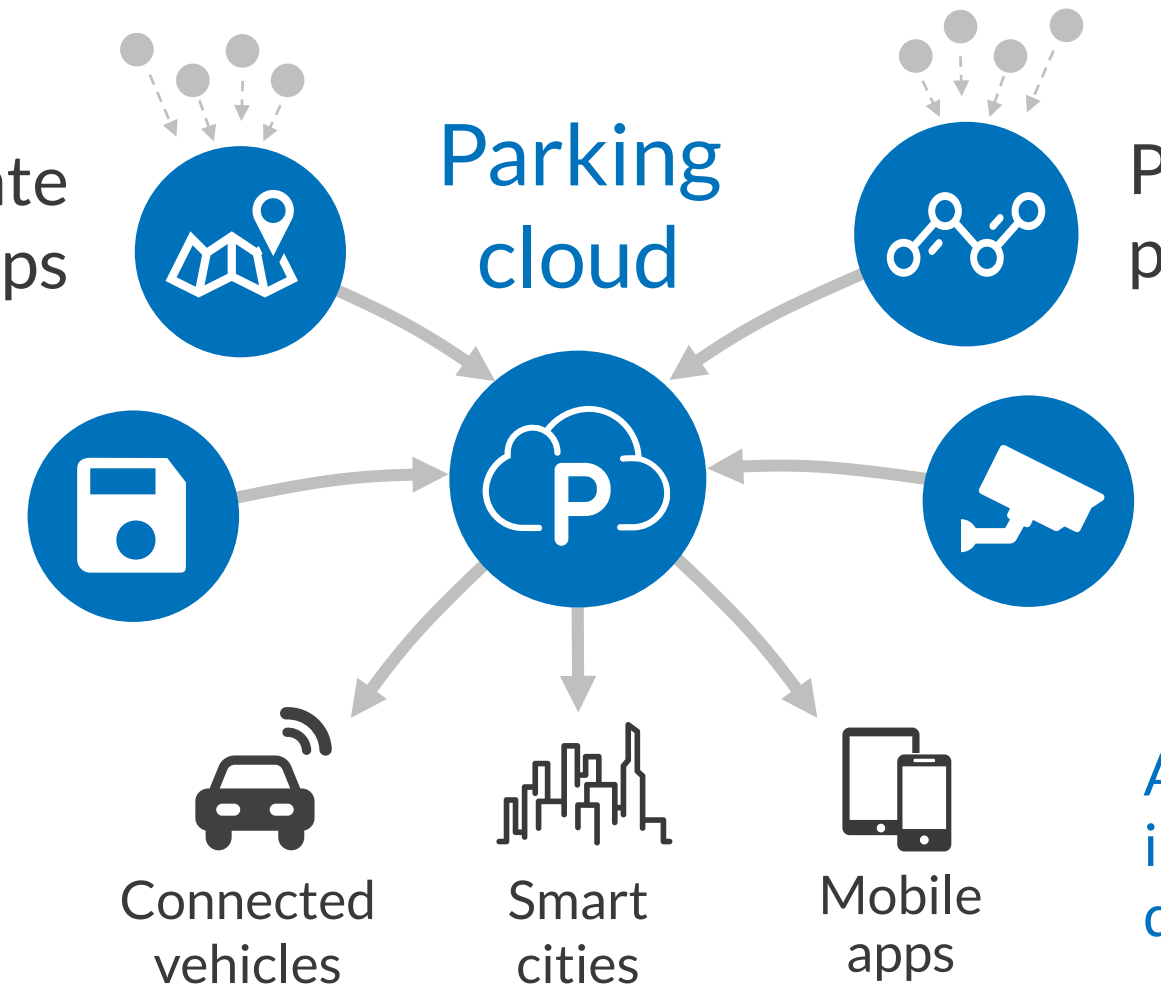
Searching for parking causes ...

30% of all city traffic

560 Mio hours wasted per year (Germany only)

9/10 drivers to desire a parking assistant

All parking data – Single Point of Access



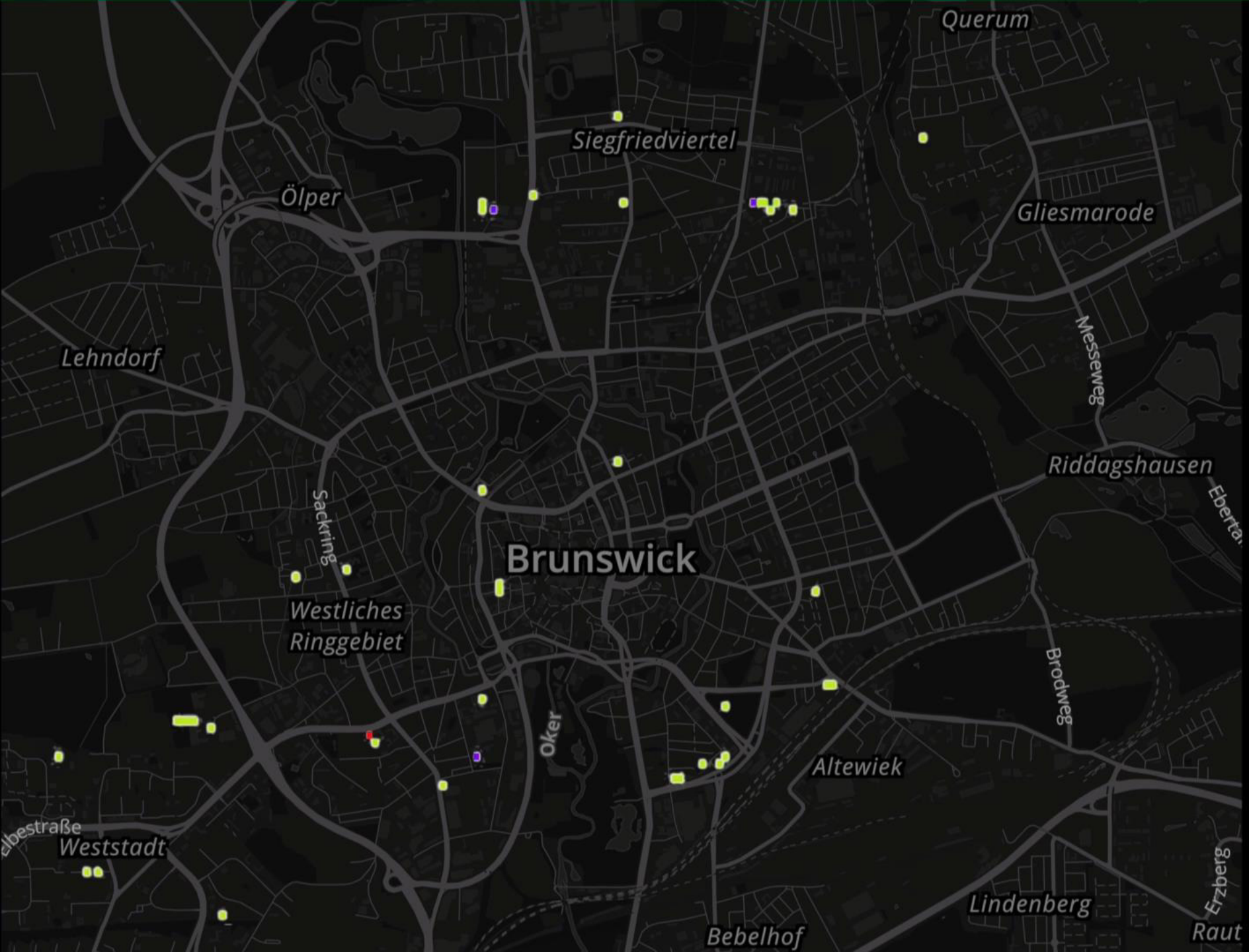
Available for all internet-enabled devices!

Analyzing Big Traffic Data

Floating Car Data from **5 Mio mobile end-user devices**

500,000 parking events per day tracked at GPS-accuracy

Nationwide coverage in Germany


Querum
Siegfriedviertel
Ölper
Gliesmarode
Lehndorf
Messeweg
Riddagshausen
Sackring
Brunswick
Westliches
Ringgebiet
Oker
Brodweg
Altewiek
elbestraße
Weststadt
Lindenberg
Erzberg
Bebelhof

time

01:17

Predicting the parking occupancy

200+ live feeds from garages and occupancy sensors

Neural Networks to model the occupancy of more than **90 Mio. On-street parking spots**

80+ influence factors:

Traffic data
Local events / Places / Businesses
Weather conditions
Socio-demographic data

Validating the parking predictions

Collecting **ground truth** data via optical sensors within the Braunschweig city area

Automated **vehicle detection** using Deep CNNs

Model accuracy (11/2017):

Off-Street	ca. 2% MAPE
On-Street	ca. 15% MAPE

IoT Parking Sensor

Automated vehicle detection using Deep CNNS for 10 - 15 parking spots

Real-time streaming of parking occupancy to the Parking Cloud

Energy self-sufficient using battery packs and a solar panel

Easy 3-Minute-installation on light poles and no maintenance required

Compliance with EU data protection regulations through **on-device processing**

Up to 70% cheaper than competitive parking sensor systems

Building accurate parking maps

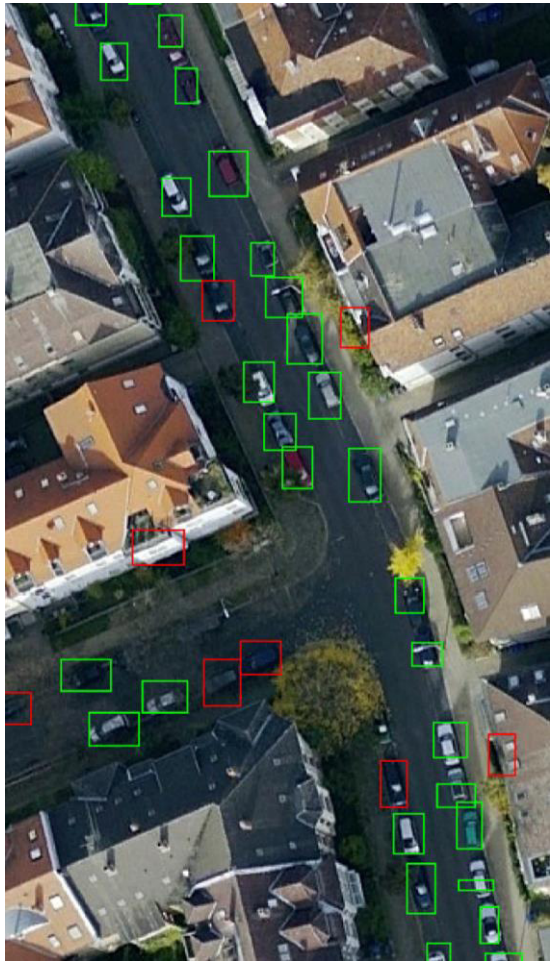
Parking maps **do not exist** for most places **but 80% of all parking spots are on-street!**

Aerial / Satellite imagery

Getting the location of parking spots

Street-level imagery

Getting opening hours, prices, restrictions etc.




parkLeft


Eing.HV,Cfd:0.9
frei
str:'frei'
Mo-Fr
8-15h
str:'Mo Fr'
str:'8 15 h'
Abs.HV,Cfd:0.7

It‘s demo time!

Our partners

Technische Universität Braunschweig

NVIDIA INCEPTION PROGRAM

Braunschweig

wolfsburg AG

EXIST Existenzgründungen aus der Wissenschaft

Zusammen. Zukunft. Gestalten.

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses des Deutschen Bundestages

ESF Europäischer Sozialfonds für Deutschland

Europäische Union

AIPARK

Artificial Intelligence Based Parking

Johannes Riedel, Product Manager

www.aipark.de

info@aipark.de

+49 531/391 3118

Urban Mobility Challenges - 11/2017