



SOLVESALL

AI, MOBILITY AND INTELLIGENT IoT

dr. Luka Bradeško, dr. Luka Stopar

Solvesall

MOBILITY SERVICES. AI, MACHINE LEARNING, SOFTWARE AND HARDWARE DEVELOPMENT

Team of 6

- Used to work together for 1 year at Solvesall and 5+ years at AI-Lab, J ožef Stefan Institute.
- Previous experience includes working in research and industry, incl. Bloomberg L.P., and startup developing NL/AI based Personal Assistant.



- 2 PhDs
- 3 masters
- 1 designer



Currently working with:

- **Adria Mobil** (motorhomes, caravans)
- **Adria Dom** (mobile homes/houses)
- **LPP** (Ljubljana bus operator)





Artificial Intelligence Laboratory

~60 people working in various areas of artificial intelligence (m. learning, data m., semantic technologies, computational linguistics , decision support, e-learning, **mobility, logistics**), tech transfer and dissemination

Sources of financing:

- EU Projects
- Industry projects

Academic partners:

- Carnegie Mellon, Cornell, Stanford, MIT, Uni. Maryland, KIT, UCL, W3C

Industrial Partners

- Bloomberg, IBM Watson, Microsoft Research, Pošta Slovenije, Kolektor, Adria Mobil

Selection of FP6, FP7 and H2020 projects

H2020 Optimum – Proactive influence on mobility users towards green transport

H2020 PrEstoCloud - Proactive Cloud Resources Management at the Edge for Efficient Real-Time Big Data Processing

H2020 euBusinessGraph - Enabling the European Business Graph for Innovative Data Products and Services

H2020 BigDataFinance - Training for Big Data in Financial Research and Risk Management

FP7 IP ACTIVE – Enabling the Knowledge Powered Enterprise

FP7 IP COIN – COllaboration and INteroperability for networked enterprises

FP7 IP EURIDICE - Inter-Disciplinary Research on Intelligent Cargo for Efficient, Safe and Environment-friendly Logistics

FP7 NoE PASCAL2 – Pattern Analysis, Statistical Modeling and Computational Learning

FP7 NoE T4ME – Machine Translation & Multilingual Information Retrieval

FP6 IP ECOLEAD - European Collaborative Networked Organizations Leadership Initiative

FP6 IP SEKT – Semantically-Enabled Knowledge Technologies

Our Customers

- **Adria Mobil**: One of the biggest EU RV manufacturers
 - Hardware and software for smart/remote RV vehicle control, predictive analytics and autonomous living space behaviour
 - We can address 8% of EU market directly (8k units/year) and can up to 40% of EU market through their owner Trigano
- **Adria Home**: Modular/Mobile home manufacturer
 - Hardware and software for smart home control and resource management
- **LPP: National public bus operator for the city of Ljubljana**
 - Realtime data sharing, API management and Access Rights Control
 - Bus traffic and bus usage Predictive Analytics (price/scope negotiation phase)
- **Mediabus: Advertising agency**
 - Extensions of bus data API with analytics and custom groupings + extensions to other cities and operators



MACH (MOTORHOME AI COMMUNICATION HARDWARE)

- RV focused platform for
 - Remote control, predictive analytics and mobility services
- Connects and control all appliances in the RV
- Integrates 3rd party services
 - Camping, navigation
- AI, ML:
 - POI influenced by sensor states
 - Automatic POI learning
 - Resource consumption predictions

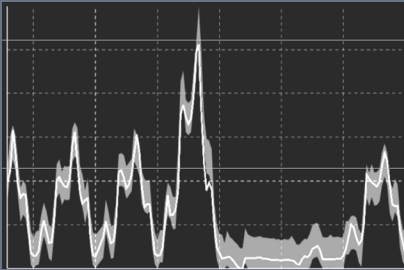
MOVIE

DEMO (office)



MONITORING HOUSING UNITS (RESOURCE MANAGEMENT)

- Leakage detection in living unit
- Monitoring multiple living units
- Detect living units that deviate from the other units
- Methods: Online regression and online distribution estimation





MACH (MOBILE AI COMMUNICATION HARDWARE)

- Connect all appliances inside the vehicle
- LTE, Wi-Fi hotspot on the go, Bluetooth
- CAN, 3xLIN for vehicle and sensor/actuator connectivity
- 6xGPIO I2C, 6xAI for sensor/actuator connectivity
- Local storage, Local processing capabilities
- OTA Updates and backend support
- Data Synchronization
- Security and Encryption





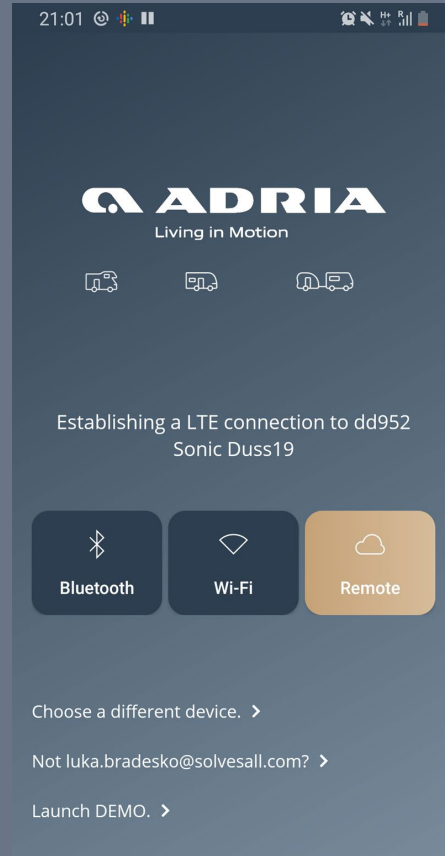
MACH (MOBILE AI COMMUNICATION HARDWARE)

> Connectivity

> LTE

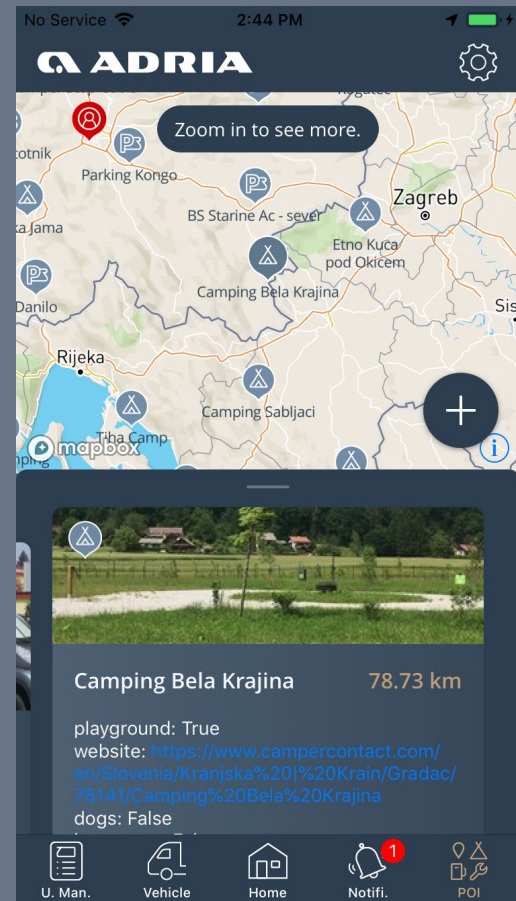
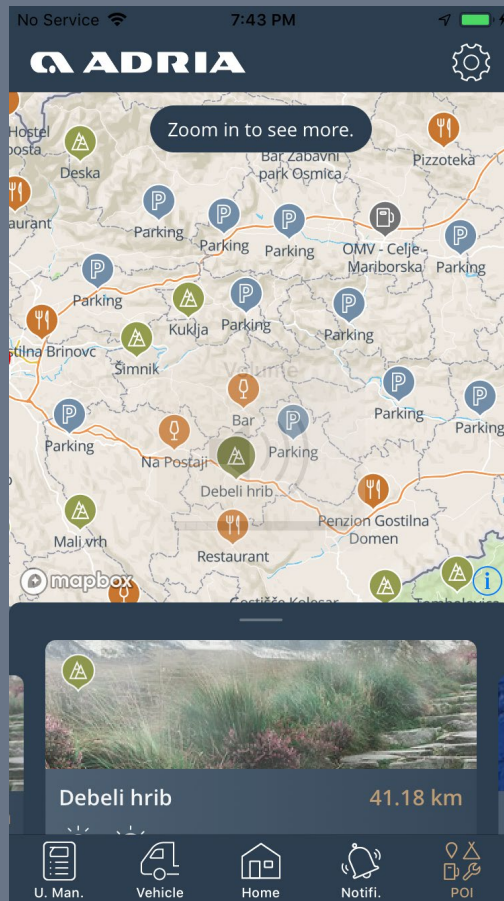
> Bluetooth

> Wifi



Smart Points of interest

- List of relevant locations for RV vehicles
- Sorting (suggestions) is proactive, based on the RV sensor states





MACH (MOBILE AI COMMUNICATION HARDWARE)

➤ Multiple levels of control

20:26 ADRIA

24 °C 23 °C ON

Lights

Energy

91% 98%

Water

0% 0%

U. Man. Vehicle Home Notifi. POI

20:29 ADRIA

24 °C 23 °C ON

Energy

Car Battery > 91 %
Voltage 13.2 V
Estimated remaining time 1.0 h

Living Unit Battery > 98 %
Voltage 13.7 V
Current 0.0 A
Health 100 %
Estimated remaining time --

Connection to the Mains > ON

U. Man. Vehicle Home Notifi. POI

20:30 ADRIA

Living Unit Battery 1 > 98 %

110
108
106
104
102
100
98
96
94

16:26 17:18 18:08 19:01 19:53

Voltage 13.685 V
Current 0.000 A
Health 100 %
Temperature 26 °C

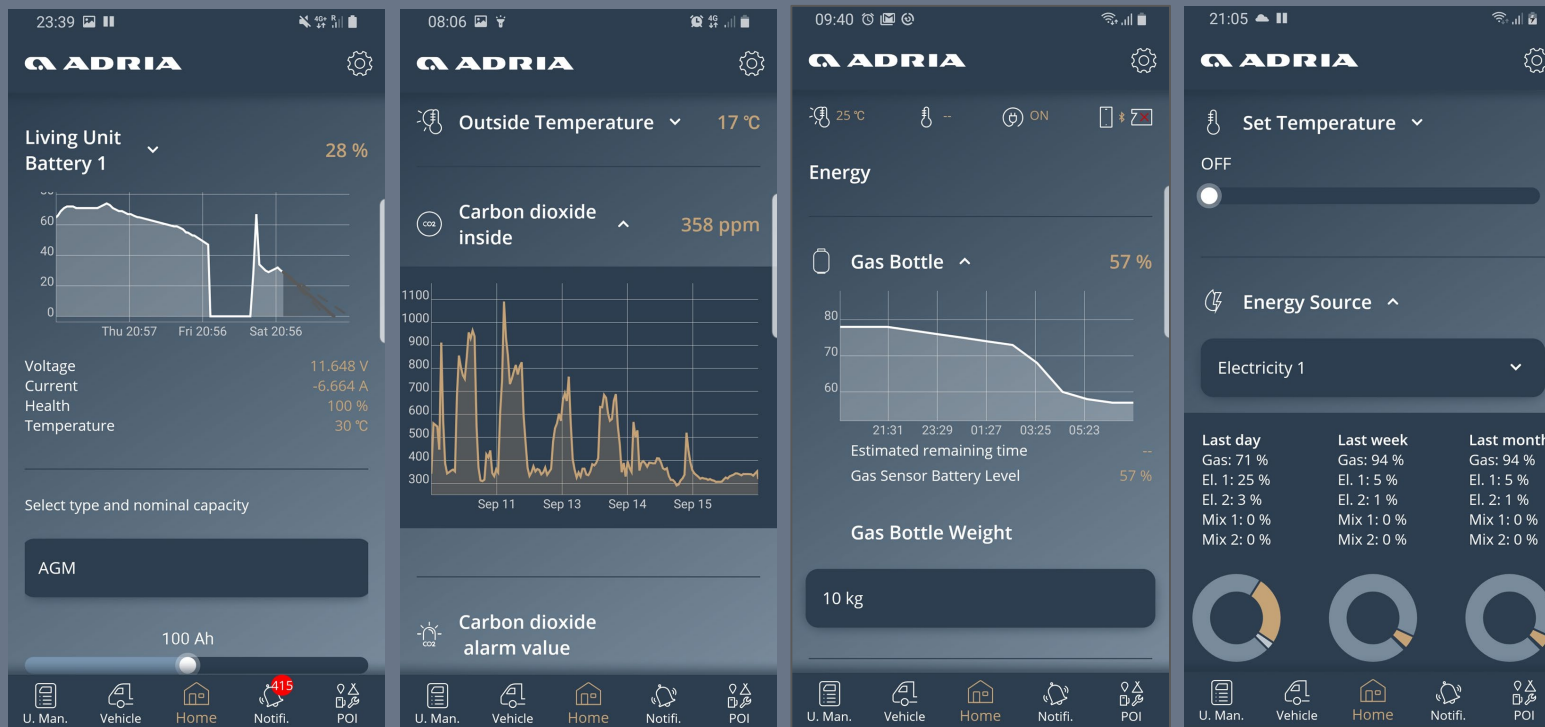
Select type and nominal capacity

AGM

U. Man. Vehicle Home Notifi. POI

MACH (MOBILE AI COMMUNICATION HARDWARE)

➤ Resource consumption statistics





MACH (MOBILE AI COMMUNICATION HARDWARE)

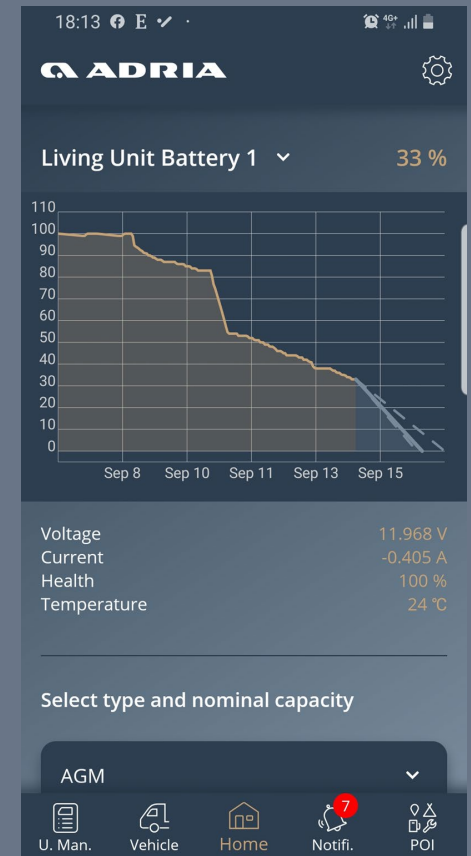
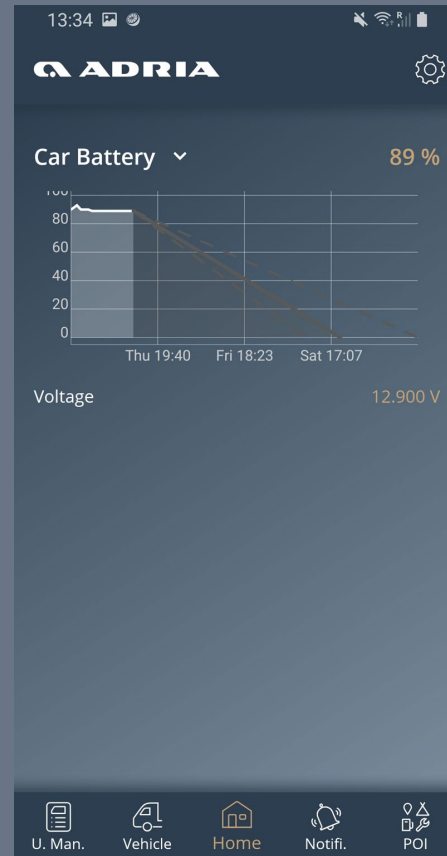
➤ Resource consumption predictions

➤ Battery SOC

➤ Gas

➤ Clean water

➤ Grey water





Questions?
THANK YOU!



SOLVESALL
luka.stopar@solvesall.com