

Young Researchers Panel

Hot Topics and Future Developments

Moderator:

Miguel García

InfoWare 2010

September 20-25, 2010 -
Valencia, Spain



Guest Panelists

- Andreas Loeffler, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany
- Miguel Garcia, Polytechnic University of Valencia, Spain
- Zbynek Kocur, FEE CTU in Prague, Czech Republic
- Anilloy Frank, Graz University of Technology, Austria
- Yuki Minami, Osaka University, Japan



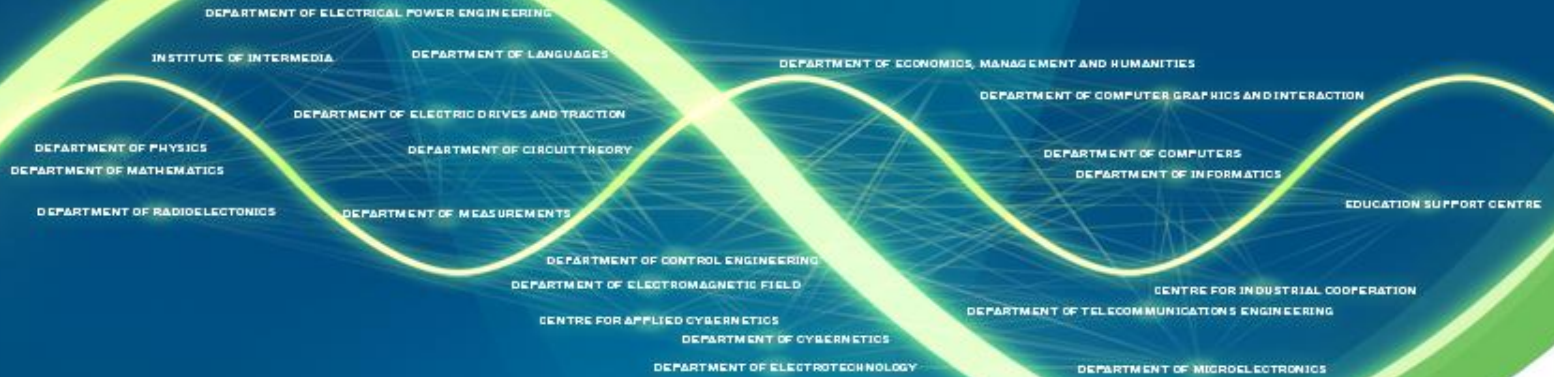
<http://www.comtel.cz>



CZECH TECHNICAL UNIVERSITY IN PRAGUE

FACULTY OF ELECTRICAL ENGINEERING

DEPARTMENT OF TELECOMMUNICATION ENGINEERING



Project activities

Marek Neruda {nerudmar@fel.cvut.cz}

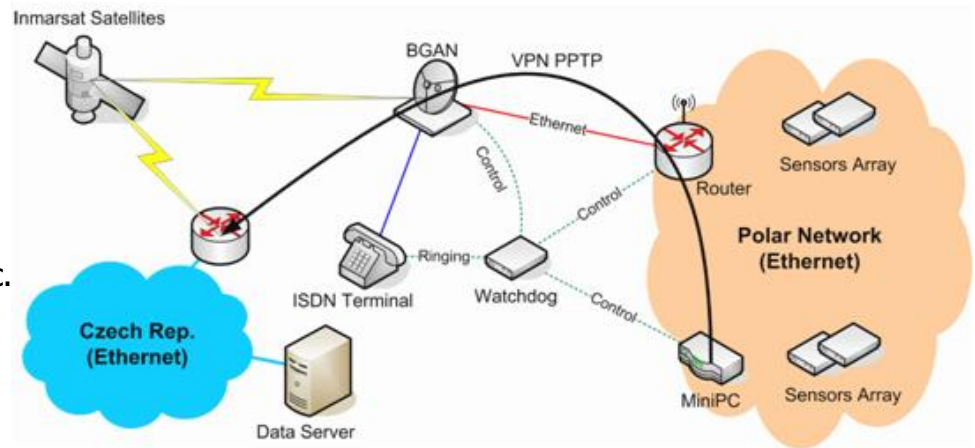
Zbyněk Kocur {kocurzby@fel.cvut.cz}



CTU FEE Department of Telecommunications Engineering Projects – Budnik Team Research Group

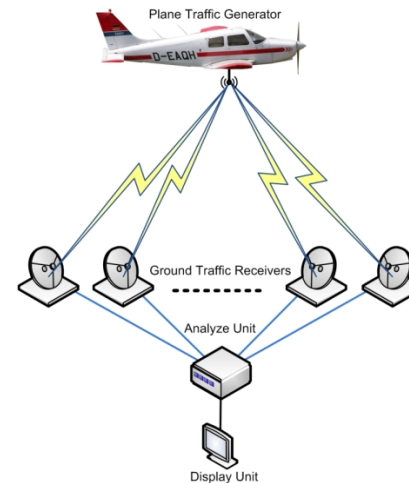
- **Data transfer from Antarctica**

- ✓ Goal: Automatic download of data from local sensor network and its transmission to the Czech Republic.
- ✓ Unmanned automatic operation.



- **High data rates between plane and terrestrial station**

- ✓ Goal: Low cost system allowing full duplex communication between plane and terrestrial station.
- ✓ Based on IEEE 802.11 and IEEE 802.16.



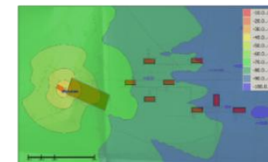
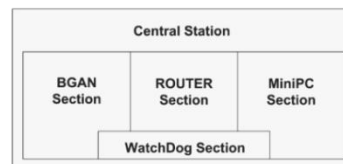
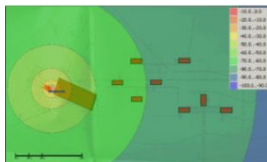
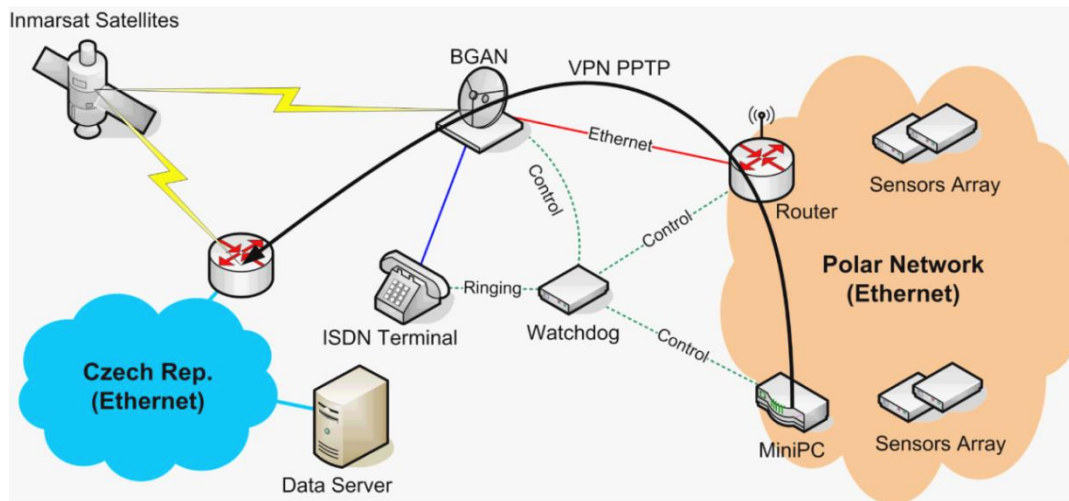
Speed: 450 km/h
Distance: 3 km
Rate: 6 (DL) / 2 (UL) Mbit/s
Delay: 5 ÷ 200 ms



CTU FEE Department of Telecommunications Engineering Projects – Budnik Team Research Group

- **Data transfer from Antarctica**

- ✓ Bender I (2008/2009), Bender II (2010/2011)
- ✓ Funded by: Research Intention by Ministry of Education, Youth and Sports;
Student's Grant Competition

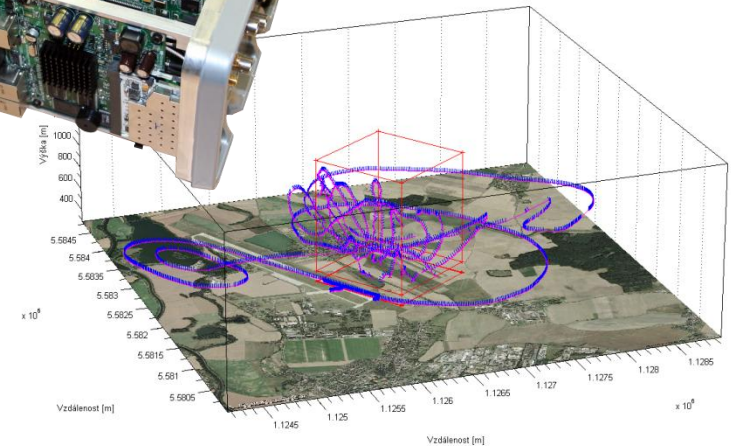
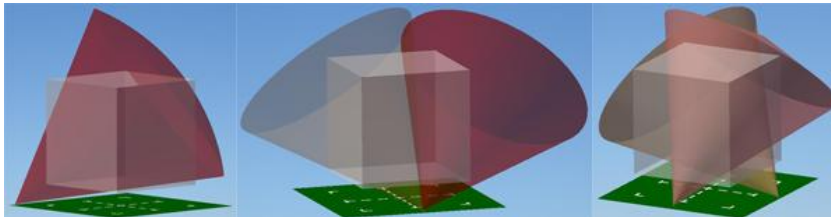
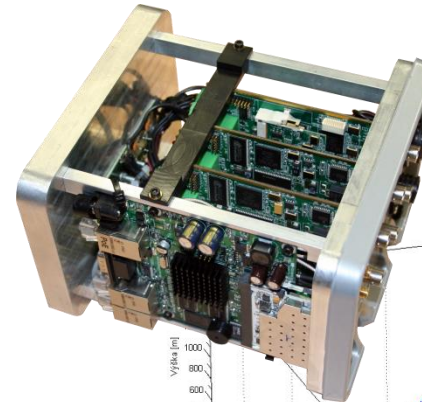
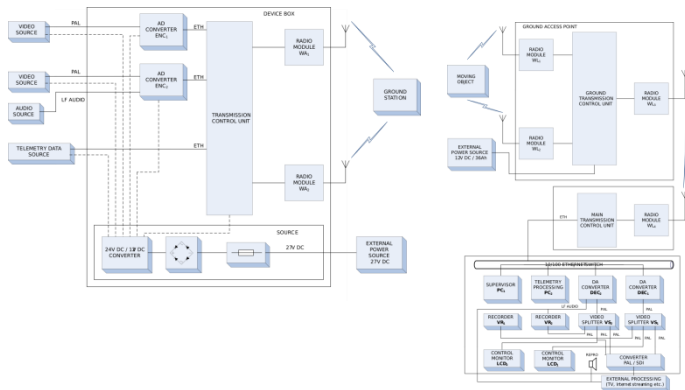




CTU FEE Department of Telecommunication Engineering Projects – Budnik Team Research Group

- **High data rates between plane and terrestrial station**

- ✓ Receiving and transmitting in several directions.
- ✓ Using of more independent data channels.
- ✓ Optimization for Ethernet and TCP/IP.
- ✓ Data redundancy.
- ✓ Founded by: Research Intention by Ministry of Education, Youth and Sports; Technological Agency of Czech Republic, LAC





The Sixth International Conference on Wireless and Mobile Communications

ICWMC 2010

Panel Discussion:

Localization of passive RFID UHF tags

Andreas Löffler

September 20-25, 2010 - Valencia, Spain

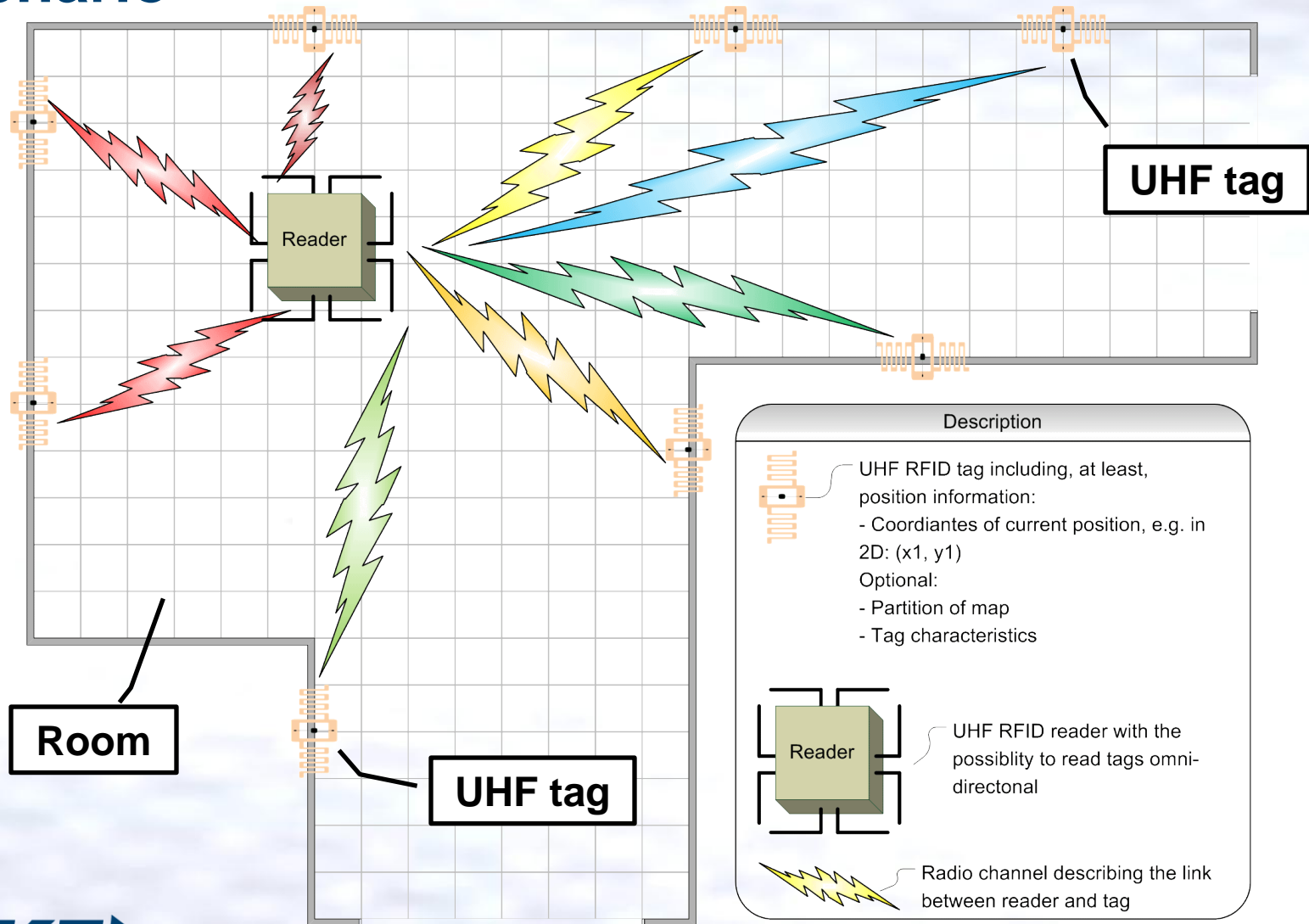


Chair of Information Technologies
with Focus on Communication Electronics

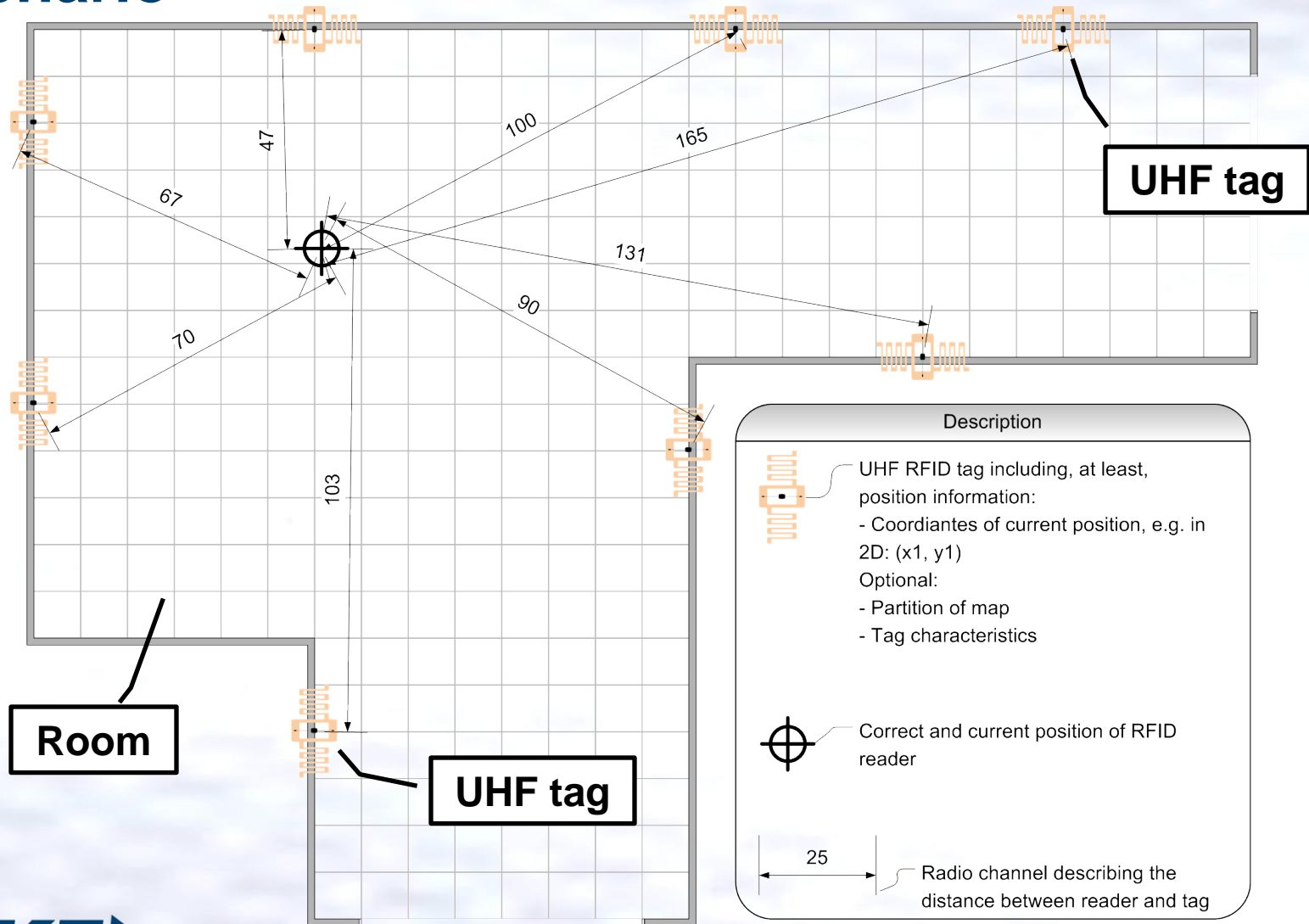
Friedrich-Alexander-Universität
Erlangen-Nürnberg



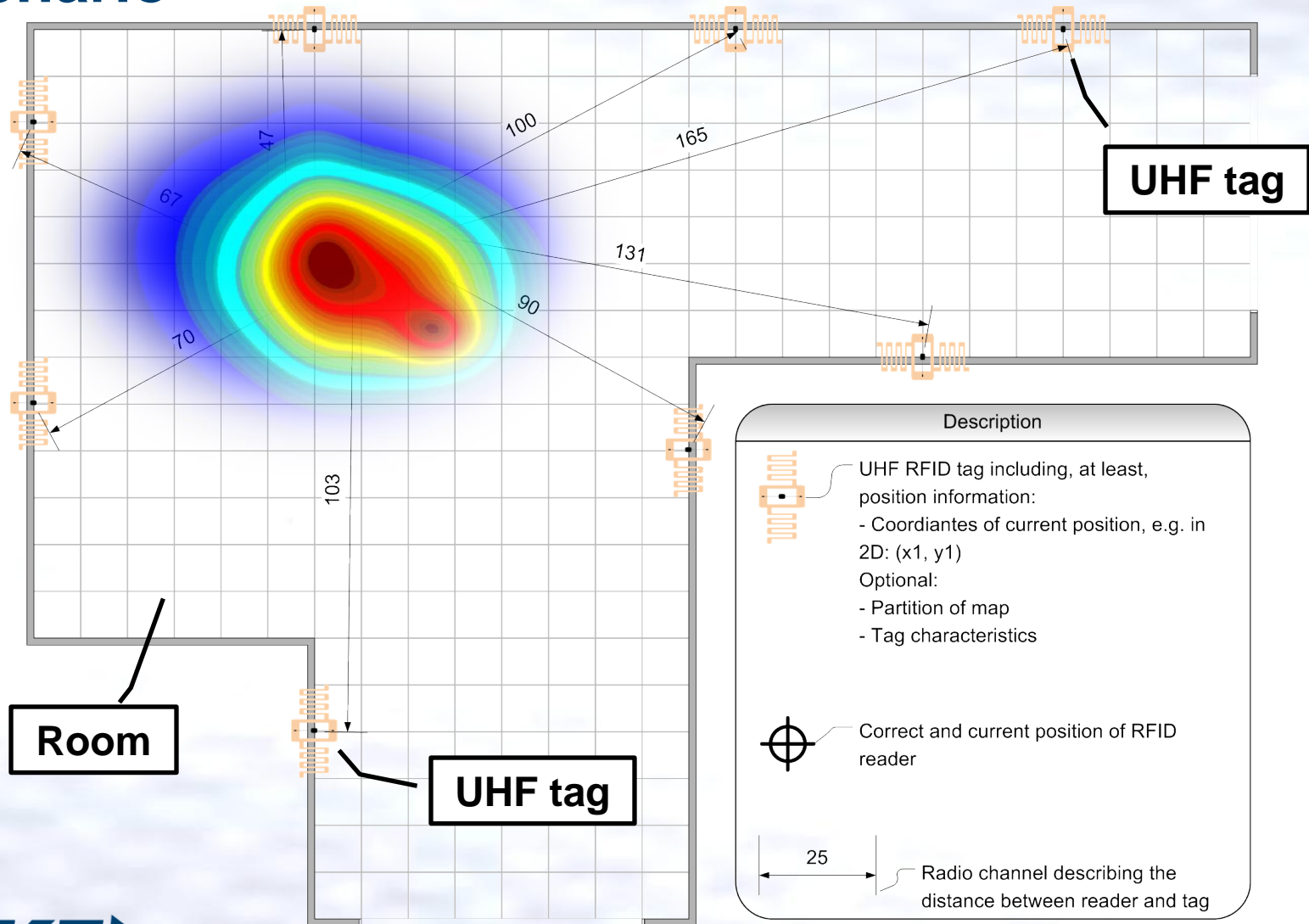
Scenario



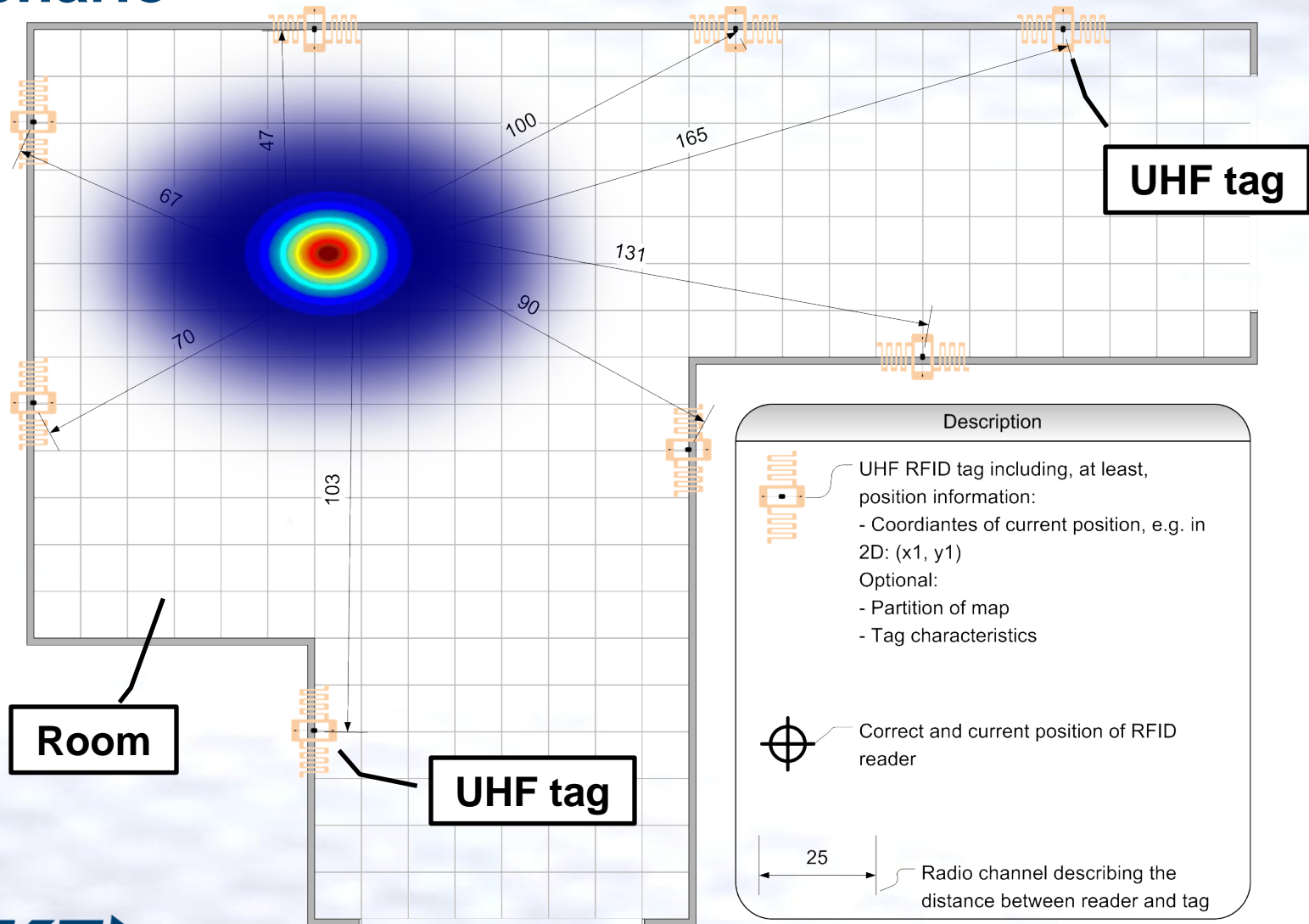
Scenario



Scenario

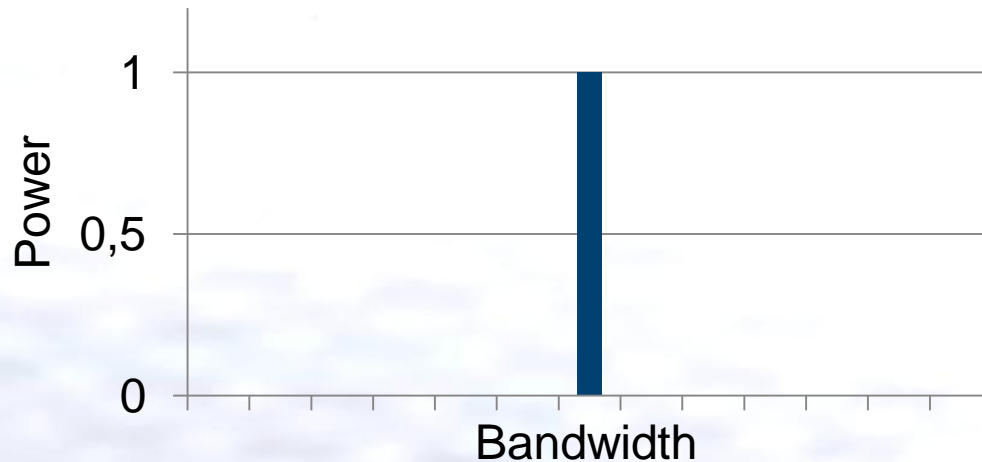
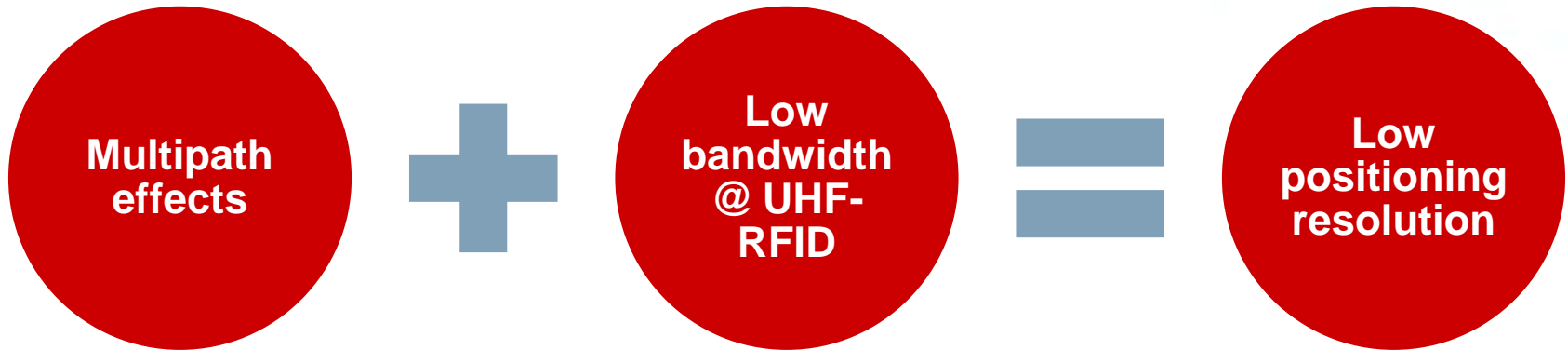


Scenario



State-of-the-Art

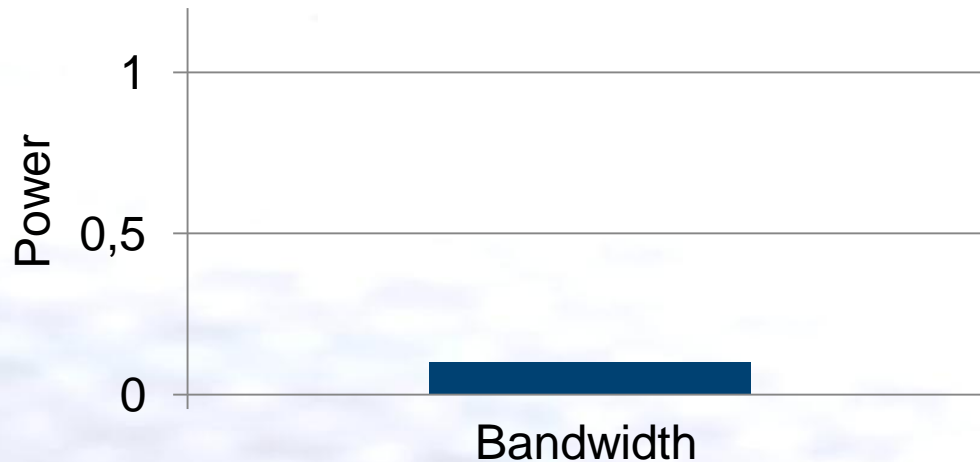
Now: **Low** positioning resolution of the reader's location



What to do?

Approach

Goal: **High** positioning resolution of the reader's location



Full UHF-RFID bandwidth but less power → Spread-spectrum signals



The Sixth International Conference on Wireless and Mobile Communications

ICWMC 2010

Panel Discussion!?

loeffler@like.eei.uni-erlangen.de



Chair of Information Technologies
with Focus on Communication Electronics

Friedrich-Alexander-Universität
Erlangen-Nürnberg



Automatic Systems for Fish Feeding in Marine Fish Farms

Miguel García

migarpi@posgrado.upv.es

Researcher of Research Institute for
Integrated Management of Coastal Areas.



UNIVERSIDAD
POLITECNICA
DE VALENCIA

InfoWare 2010
September 20-25, 2010 -
Valencia, Spain

Reasons

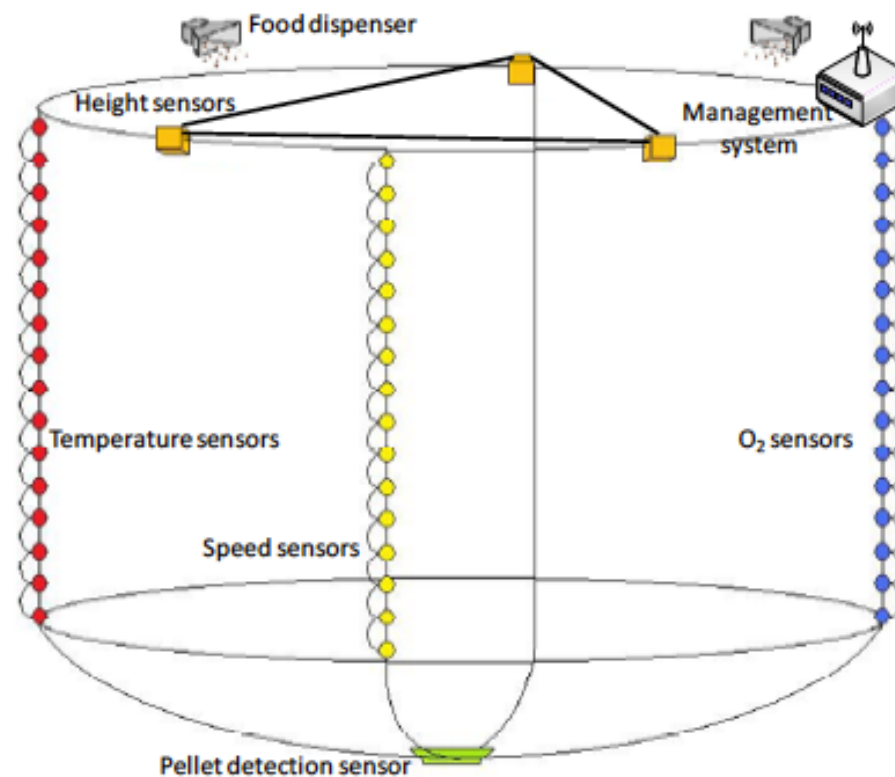
- Nowadays many fishes that we consume, they are bred in fish farms.
- The lost food in the cages is close to 8.26%, of the total food.
- The food expenses almost represent the 60% of the total costs of the marine farm exploitation.
- The food that gets lost in the feeding process of these facilities should be controlled, because:
 - the wasted food is translated into important economic losses.
 - the wastage accumulation in the seabed causes notorious changes in the silts chemistry of the near farm areas

Challenges

- Many water parameters should be taken into account:
 - PH, salinity, the temperature, dissolved oxygen (OD) the transparency, the suspended solids (SS), ammonium, nitrates, the total nitrogen (NT) or match soluble reagent (PSR), etc.
 - All this parameters influence the behavior of fishes in cave.
- The underwater communications are difficult, even more if we use wireless communications.
- The conditions of the water are not always good and suitable to place the sensor nodes.
- How do we estimate the quantity of necessary food in cave?
 - It depends of the type of fish, its size, the season of the year.

Possible solutions

- The traditional methods using scuba-divers or cameras.
- The systems based on mathematical formulations.
- Automatic systems, for example:





Model-based Variability Management for Complex Embedded Networks

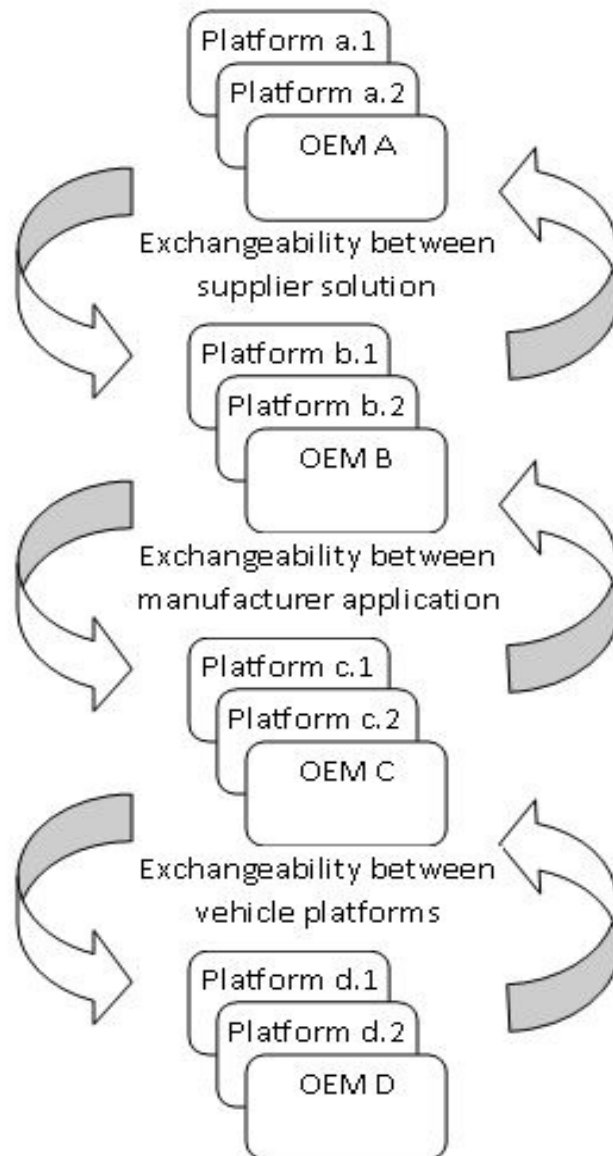
By
Anilloy Frank
Eugen Brenner



Motivation

- Complexity of Embedded software
- Exchangeability
- OEM
- Standardized Structure

- Application
 - Automotive
 - Aviation
 - Communication
 - Electronics

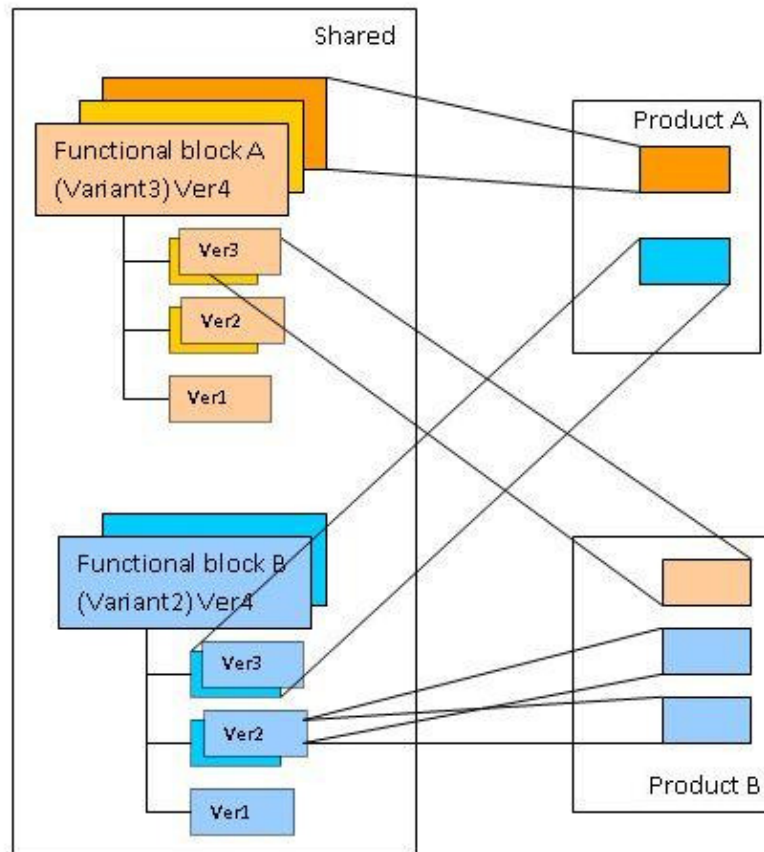


Why Variants?

- Ability to customize
- Reuse
- Software for different regions (Europe, US, Asia, etc.)
- Different Sensors/Actuators, different device drivers
- Functionality distribution to different ECU's



Specification of cases

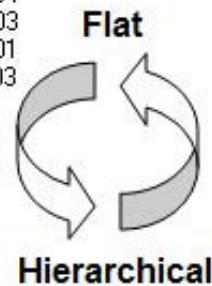


- exhibit compatibility issues between functional blocks
- extracting features to identify and specify the functional blocks
- tracks usability and prevent inconsistencies due to deprecating variants
- testing mechanism for validations to maintain high quality for components and its variants.
- a process to determine whether a functional block or its variant exist



Workspace_DOMain_GRouP_PRoject_FunctionBlock_PartNo_VARiant

```
FV_BodyAndComfort_Access_P7834_ATWSLHFD_AS45781_0003
FV_BodyAndComfort_Access_P7834_ATWSRHFD_AS45782_0003
FV_BodyAndComfort_Access_P7834_ATWSLHFD_AS45781_0004
FV_BodyAndComfort_Access_P7834_ATWSRHFD_AS45782_0004
FV_BodyAndComfort_Access_P7834_ATWSLHRD_AS45783_0004
FV_BodyAndComfort_Access_P7834_ATWSRHFD_AS45784_0004
FV_BodyAndComfort_Access_P7838_CLDLRB_CL45785_0003
FV_BodyAndComfort_Access_P7838_CLKPM_CL45786_0002
FV_BodyAndComfort_Access_P7838_CLTF_CL45787_0001
FV_BodyAndComfort_Visibility_P7834_BLM_BL45788_0003
FV_BodyAndComfort_Visibility_P7834_BLM_BL45788_0002
FV_BodyAndComfort_Visibility_P7834_BLM_BL45788_0001
FV_Chassis_ESC_P7847_ABSEBD_ESC45792_0004
FV_Chassis_ESC_P7847_ABSEBD_ESC45792_0003
FV_Chassis_ESC_P7847_ABSEBD_ESC45792_0001
FV_Chassis_ESC_P7847_ABSCBC_ESC45793_0003
```



```
NC :
├── WS : FV
│   ├── DOM : BodyAndComfort
│   │   ├── GRP : Access
│   │   ├── GRP : Visibility
│   │   │   ├── PRJ : P7834
│   │   │   │   ├── FB : BLM
│   │   │   │   │   ├── PN : BL45788
│   │   │   │   │   │   ├── VAR : 0003
│   │   │   │   │   │   ├── VAR : 0002
│   │   │   │   │   │   └── VAR : 0001
│   │   └── DOM : Chassis
│   │       ├── GRP : ESC
│   │           ├── PRJ : P7847
│   │               ├── FB : ABSEBD
```

Project Solution

Challenges

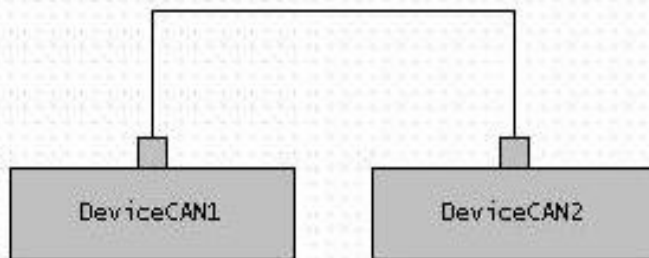
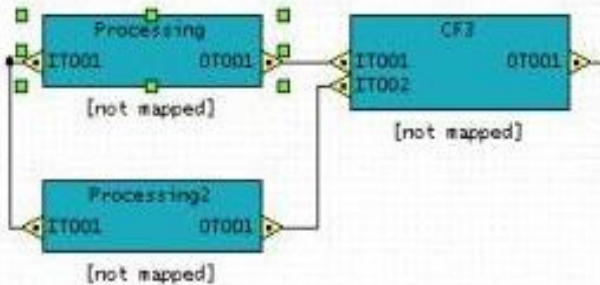
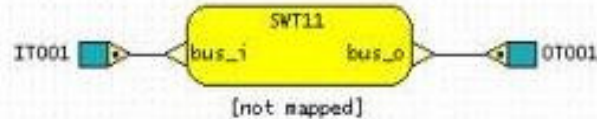
- Identify components from name
- Searching SW components, Variants in core assets

Names

- Transform flat to hierarchical
- Build a dictionary
- Assign weights



Project Solution



Challenges

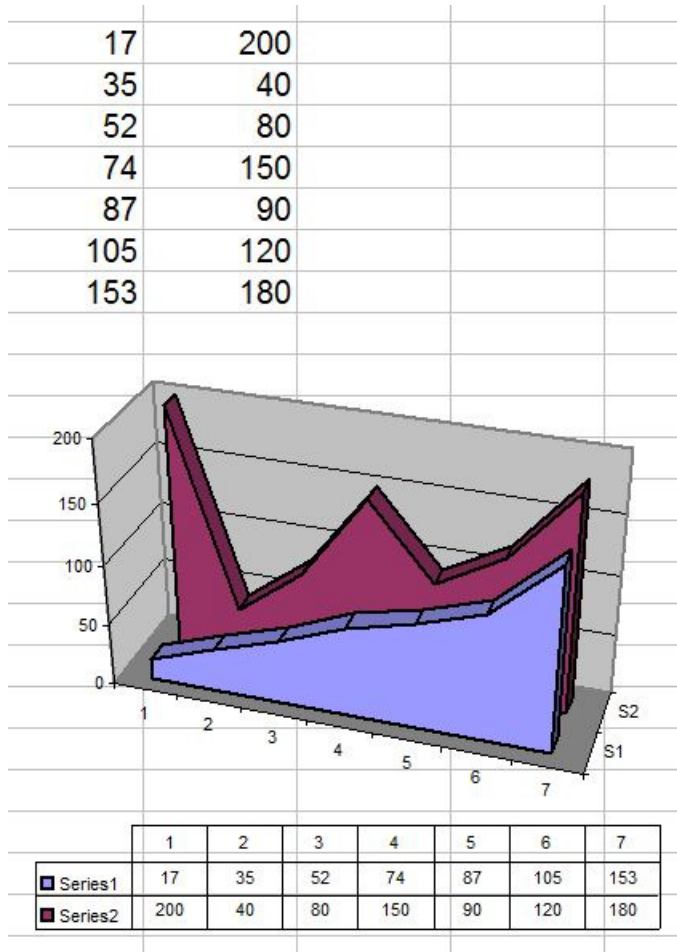
- Identifying types based on spatial features

Architectural (spatial) features

- Input, output, types
- Object description
- Meta data, key words



Project Solution



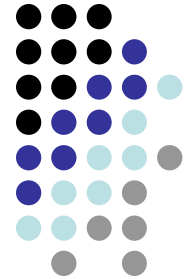
Challenges

- Identify types based on functionality

Functional features

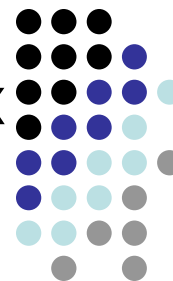
- Functional use
- Parameters
- Map variants
- Truth tables
- Calibrations

Conclusion



The idea focuses on the interactive aspect of design tools, to enhance variability management.

Model-based Variability Management for Complex Embedded Networks



Thank you for your attention.

Anilloy Frank
Institute of Technical Informatics
Graz University of Technology
Inffeldgasse 16/1
8010 Graz
anilloy.frank@student.tugraz.at, frankanilloy@gmail.com