



UNIVERSITÀ
DI PARMA



MOTORVEHICLE
UNIVERSITY OF
EMILIA-ROMAGNA

Vehicular Communications

Prof. Gianluigi Ferrari, Prof. Luca Davoli

Internet of Things (IoT) Lab

Department of Engineering and Architecture

University of Parma

<https://iotlab.unipr.it>

Course Overview

Learning objectives

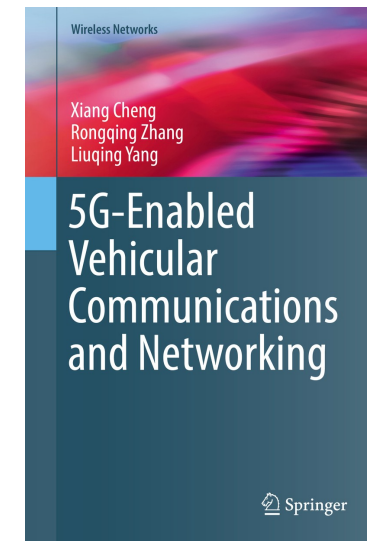
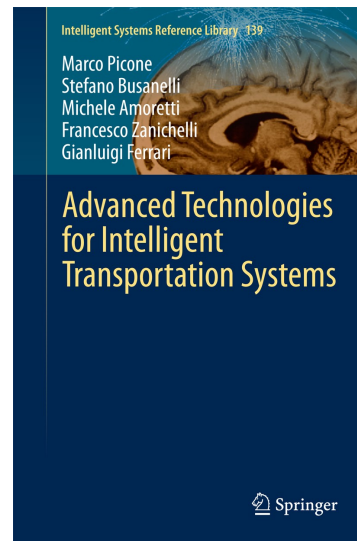
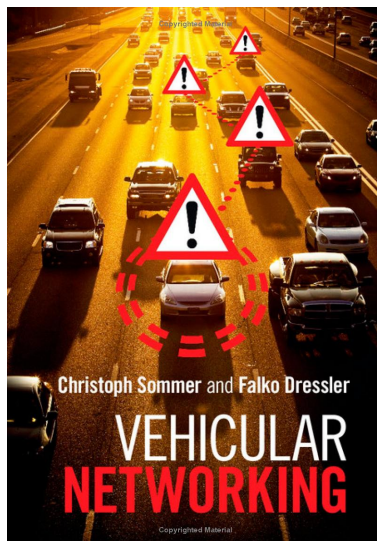
- Introduce the students to vehicular communications
- Provide the fundamentals of communications and networks to understand and design vehicle-to-everything (V2X) communication systems
- Discuss on the adoption of V2X communication systems in real scenarios and modern smart cities

Course programme

1. Intra- and extra-vehicle communications
2. Communication protocols: protocol stacks, physical layer, link layer, network layer, routing (broadcast, geocast, ad-hoc)
3. Communication technologies: radio (non-cellular, i.e., IEEE 802.11p, IEEE 1609, ETSI ETS G5), cellular-based technologies (i.e., LTE-V2X, 5G C-V2X), security principles
4. Special topics (i.e., advanced applications, visible light communications), hands-on, personal projects

Bibliography

1. Materials provided by the lecturers
2. Slides, news and additional material will be available on Elly
<https://elly2023.dia.unipr.it/course/view.php?id=582>



Course schedule

| September | | | | | | |
|-----------|---------|-----------|----------|--------|----------|--------|
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | |

| October | | | | | | |
|---------|---------|-----------|----------|--------|----------|--------|
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | | | | | |

| November | | | | | | |
|----------|---------|-----------|----------|--------|----------|--------|
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

| December | | | | | | |
|----------|---------|-----------|----------|--------|----------|--------|
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

- Lectures
 - Tuesday, 10:30-13:30, Lab. Informatica 3
 - Thursday, 08:30-10:30, Aula M
- Attendance at the lessons is not mandatory, but recommended
- If needed, lectures changes or extra lectures will be noticed through the official Elly course website

Assessment methods and criteria


- It is foreseen the use of on-going evaluations (midterm and final) in substitution of the written test (regular exam) for the theory part
 - An additional oral exam may be requested by the instructor
- It is also foreseen a project development (based on lab activities) or a short report (for example, on scientific papers of interest)
- The final evaluation will consider both written and project/report parts

Contacts



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