



Ewolucja Sieci



Koncepcja przedmiotu

Wykłady:

→ wykład organizacyjny – dzisiaj, oraz

11 wykładów: wtorki 15:00 (lub 13:15), sala 201/D6

→ http://tele.agh.edu.pl/~kulakowski/evolution_lectures.html

Projekt:

→ nowe tematy z zakresu sieci,

rzadko dotychczas poruszane na wykładach

→ 5-osobowe grupy, zajęcia i projekt prowadzone po angielsku

→ http://tele.agh.edu.pl/~kulakowski/evolution_project.html



Wykłady

- **hot topics**: trendy w rozwoju IT
- wprowadzenie do **dalszych kursów** na tych studiach
- tematyka potencjalnych **prac magisterskich**
- prowadzący: **8 wykładowców z Instytutu Telekomunikacji**
+ **2 ekspertów firmowych**



Egzamin

- egzamin ustny na koniec semestru, 3 osoby/godzinę
- materiał pod egzamin to tematyka 11 wykładów
- termin „0”: 13-14 czerwca
- termin „1”: 1-2 lipca, termin „2”: 4 lipca??
- termin „3”: 13 września

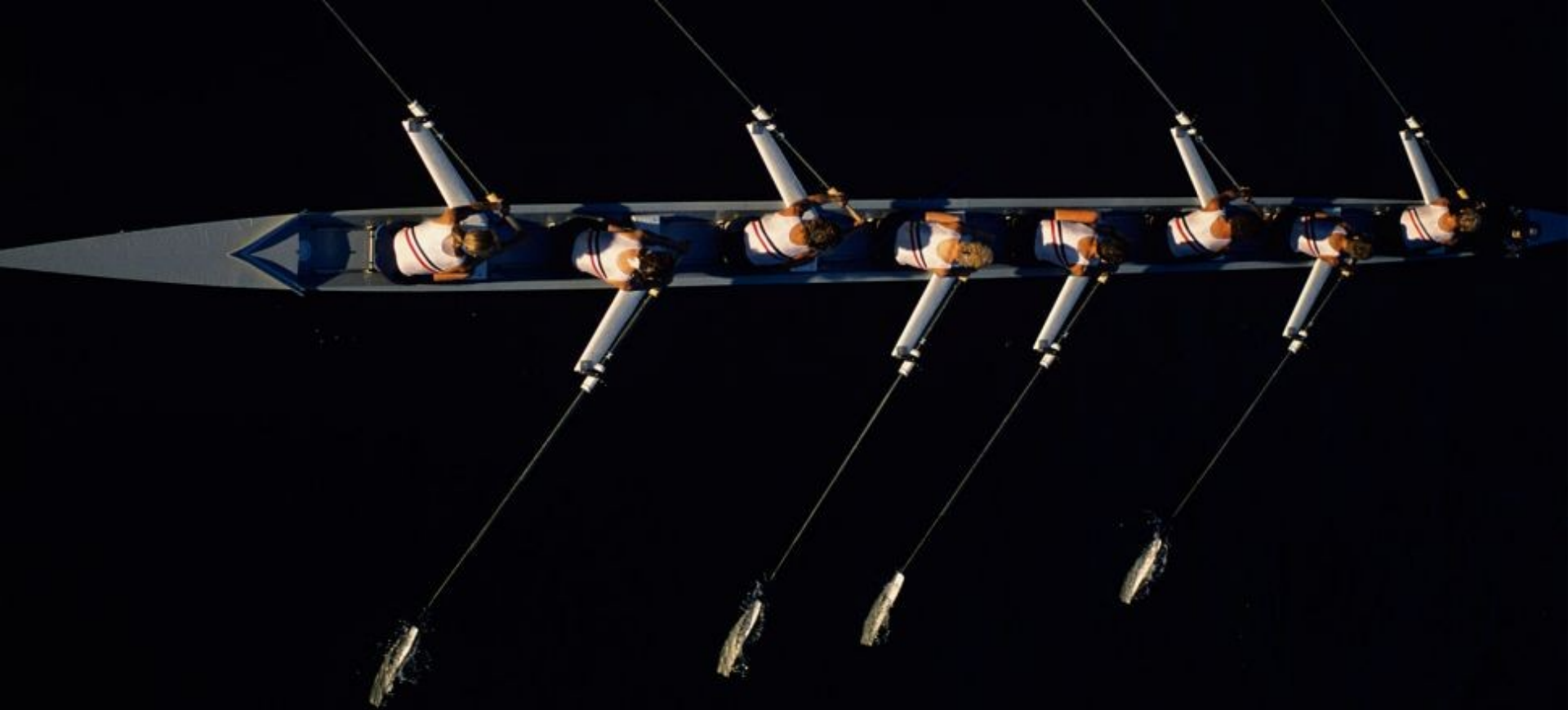
Ocena końcowa z przedmiotu to średnia ważona:

55% oceny z egzaminu + 45% oceny z projektu



Prace magisterskie

- to są krótkie studia ;-)
- proszę się już rozglądać, szukać tematów,
rozmawiać z potencjalnymi opiekunami,
temat należy zatwierdzić do września 2024 r.
- napisaną pracę dyplomową
należy złożyć do września 2025 r.



Project
(team work)

21 proposed project (hot) topics

1. Communication between autonomous vehicles
2. THz indoor communications (e.g. with Sienna)
3. LiFi-based Internet of Things
4. Energy harvesting for communications
5. Smart grids control (with machine learning)
6. In-body medical networks
7. Direct brain-computer interfaces
8. Human exposure to electromagnetic fields
9. Integrated/joint communication and sensing
10. Machine learning for wireless comm. (a chosen case)
11. Metaversa feasibility with 6G infrastructure
12. Reconfigurable intelligent surfaces and/or metamaterials
13. NLoS mitigation techniques for wireless localization
14. Communication at battlefields / military applications
15. Earth-satellite links for low earth orbits
16. Hacking GPS: a security study for navigation services provided by GPS Navstar network

Project teams should choose different topics!



Why **these** topics?

To become experts in a chosen hot area in IT science?

Not necessarily.

The main goal of the course is:

to learn how to explore an unknown topic.



Projects: what you are going to do?

- **CHOOSE** a project topic, **CREATE** a team (5 people is recommended)
- **CHECK** its state-of-the-art
- **FIND** a research problem to be explored and later presented
- **PREPARE** an initial presentation: „what we are going to do?“
- **PERFORM** the research: simulations/calculations/demonstration
- **PRESENT** your research results
- **WRITE** a paper (few pages + figures/tables/equations)
- **PREPARE** the final presentation, be ready to answer **QUESTIONS!**



How to realize the project?

1. Choose a project topic and create a team:

- each team should choose different topic!
- think about your role in your team:

MANAGER

RESEARCHER

CODE DEVELOPER (more than one?)

ANALYST

and **EDITOR**

When choosing a project topic

- I suggest you to check some papers before (e.g. in IEEExplore or Google Scholar)
- if you think about your own topic, visit me on Wednesday



How to realize the project?

2. More about creating teams and choosing the topic

- create teams in a week (till March 1st)
- fill the list of the teams, choose the meeting time-slots before 6th of March
- the first obligatory meeting, 15 minutes,
6th of March, room 208/B9
- the presence of all team members is required
- **it is worth 0-5 points!**



How to realize the project?

3. Read the state-of-the-art of the project topic

- comprehend the main idea
- check some details
- you should be experts there!

4. Find an interesting research problem to be explored

- something essential for the topic
- something where your team can perform some research

Potential risks:

- "we don't have a proper tool"
- "everything is already done"

How to realize the project?

5. Prepare your first presentation

- what is the main idea of the topic?
- what you are going to read, what issues to explore?
- what research you plan to perform?
- define research scenarios, metrics/parameters, tools
- define the roles / responsibilities of team members
- meetings: **3-4th of April**
- 40 minutes per team:
20 minutes of the presentation + short discussion
- **it is worth 0-10 points!**



MANAGER

How to realize the project?

6. Perform the research

- simulations/calculations/software
- it is your main scientific task in the project!

7. Present your research results

- the results do not need to be the final ones, but:
- some simulations/measurements/software should be already performed/written
- you should be able to demonstrate their outcome
- if you have any doubts, it is a good moment to discuss them
- meetings: **24-25th of April** (the exact hour is to be defined)
- 40 minutes per team, **it is worth 0-10 points!**

CODE
DEVELOPER

How to realize the project?

8. Polish/update your research results

- simulations/calculations/demonstration/software
- if anything should be changed/corrected, do it now!

9. Write a short paper about your research

- few pages (preferably in LaTeX) + figures/tables/equations
- no full state-of-the-art, just a few paragraphs of introduction
- the description of the research scenario(s) + methodology
- all the obtained research results
- send your paper via e-mail to me, deadline: **24th of May**, EOBD
- **it is worth 0-10 points!**

EDITOR

How to realize the project?

10. Prepare the final presentation

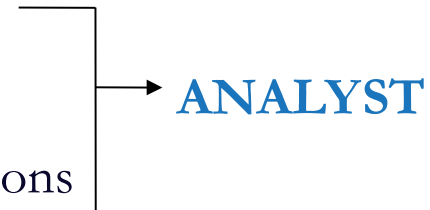
- full state-of-the-art, refer to the literature results!

- crucial issues



- your research (everything from the written report):
scenario, methods, results, conclusions

- analysis of the results, comparison with literature, conclusions



- meetings: **5-6th of June**

- 50 minutes per team:

30 minutes of the presentation + discussion + questions

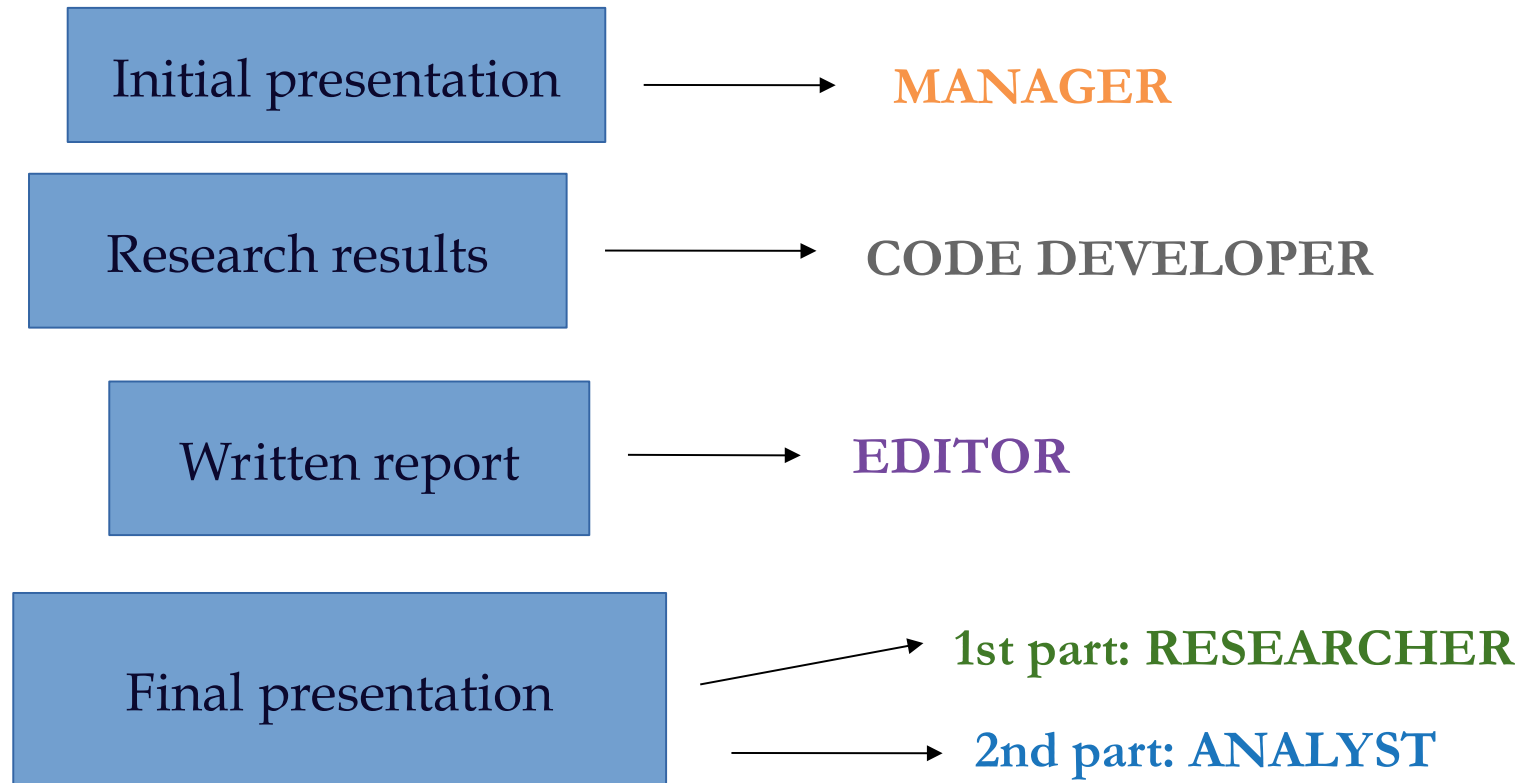
- **it is worth 0-20 points!**

- all team members should be able to answer questions

about the project topic, state-of-the-art and your research

(+ **0-5 points per person**)

The responsibilities



The responsibility is worth extra 0-20 points per person!

You may engage in many roles, e.g. manager 30% + code dev. 70%



Summary: project milestones

- Choose a project topic: **6th of March**
- Prepare the initial presentation: **3rd of April**
- Present research results: **24th of April**
- Write the paper: **24th of May**
- Final presentation: **5th of June**



To help you during the semester:

Consultations:

Wednesdays: 13:15-14:45 and 15:00-16:30 (room 207/B9)

and the e-mail contact:

`kulakowski@agh.edu.pl`



Thank you for your attention!

**It is a good moment
to ask all remaining questions!**

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http://tele.agh.edu.pl/~kulakowski/evolution_lectures.html

http://tele.agh.edu.pl/~kulakowski/evolution_project.html