Combinatorial Algorithms

RM35KOA

Grading system

To get an assessment, the following requirements have to be met:

◎ obtain at least 30 from 50 points

◎ successfully solve all homework assignments

How to earn points:

◎ 20 points (10p for each) for theoretical tests I, II (written at lectures)

◎ 15 points for a semester project

◎ 15 points for homework assignments No. 1-3.

(5 points for each assignment if successfully submitted before the deadline)

For more information, please check the course website:

https://cw.fel.cvut.cz/wiki/courses/rm35koa/start

Homeworks

◎ homeworks can be coded in **Python**, C++ or Java

◎ each homework (the source code) must be handed into BRUTE (**https://cw.felk.cvut.cz/brute**) with a hard deadline specified in BRUTE

◎ homeworks are graded automatically by the BRUTE

◎ there is 1 penalty point for each commenced week until the homework is uploaded successfully (you can't get less than 0 points for the homework)

◎ Check https://cw.fel.cvut.cz/wiki/courses/rm35koa/upload_system for technical requirements on the submitted source code

Semester project

◎ each student chooses from the following two options:

a. **Cocontest**
Students participating in the contest implement a solver for one specific combinatorial optimization problem

b. **Research on a chosen topic**
A student chooses a non-trivial problem from the combinatorial optimization area on which they will work during the semester. The lab teacher must approve the topic!

c. if a student wishes to choose Research on a chosen topic, they will email their lab teacher with the selected topic by the strict deadline of 3. 3. 2023

Combinatorial Optimization Contest 2023

◎ Optimization competition

   ○ single real-life optimization problem

   ○ you provide only code with your solution; no report needed

   ○ solutions are evaluated by BRUTE

   ○ grading comprises both the ability to solve a set of basic instances and the rating among the other students on harder instances

   ○ computation time given for the solver is bounded

◎ Past contests **"Hall of Fame"**

   ○ **2022 winner: Jiří Němeček**

   ○ 2021 winner: Karolína Machová

   ○ 2020 winner: Václav Voráček

   ○ 2019 winner: Pavel Gramovich

   ○ 2018 winner: Lukáš Hejl

   ○ 2017 winner: Ondřej Benedikt

   ○ 2016 winner: Vladimír Kunc

IKEM topics

- Machine learning: data from our internal Information System (CZ only)
    - Automatic completion of medical reports
    - Detection of anamnesis from medical reports (smoker, drinker, …) or analysis of unstructured data in general, OCR
    - Statistical prediction of developing complications
- Virtual reality:
    - Extending application for organ visualization from CT images (e.g., decimation of complicated models)
    - Organ segmentation (detection of veins, cancer cells, ….)
- Statistical analysis of omics data (microbiome, metabolome, …)
    - Many features/small number of observations
- Software projects: no-code designer of forms for research studies (CZ only)
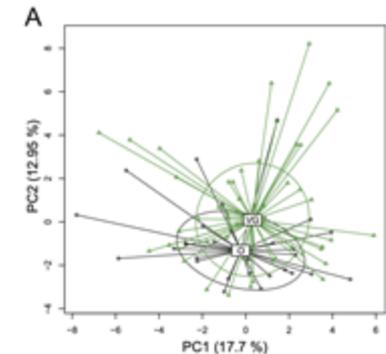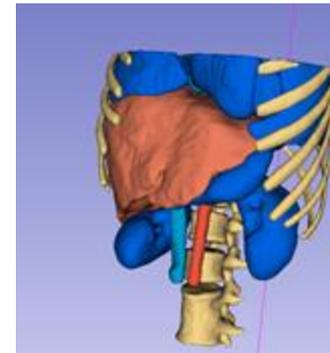
Research on Chosen Topic

◎ students can solve a problem for some company, project, diploma thesis etc.

◎ the assignment has two parts: a written report and the implementation

◎ submission is divided into 3 parts constrained by deadlines

　○ 1 penalty point for the late delivery (for each part)

◎ written document is between 4 and 8 pages

◎ the evaluation is performed by the student's lab teacher; it considers fulfilment of formal requirements and the work quality

For more information about what we are doing, our projects, thesis topics etc., please visit:

http://industrialinformatics.fel.cvut.cz/

https://www.facebook.com/IIRC.CVUT/