CSIE5410 Optimization algorithms

Lecture 0: Course organization

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Quick informaiton

CSIE 5410 Optimization algorithms

- This is a *THEORY* course.
- There will be *NO* deep learning.
- There will be *NO* programming homework.
- There will be *A LOT OF* mathematical proofs.
- There will be *NO* linear programming, semidefinite programming, etc.

Course website:

`http://bit.ly/csie5410`

Course registration

- The classroom can only allow 50 students.
- There are now 30 registered students.
- Therefore, we can only take about 20 more students.
- Please try 第三類加選 in the first weeks. If you do not succeed, then we do 人工加選.
- Auditing is welcome, as long as there are seats.

Last year's experience

- # registered students at the beginning: 41
- # registered students around the midterm: 24
- # students who passed: 22

Evaluating your math maturity

Work out Homework 0, which is *to be graded*.

Submit your homework report on the course website (registered students) or by email to `csie5410@gmail.com` (unregistered students).

Course organization

Logistics

- **Credits:** 3
- **Prerequisites:** Calculus, linear algebra, probability theory, and *math maturity*.
- **Grading:**
  - 40%: Three highest homework/quiz grades.
  - 20%: Written midterm with one double-sided hand-written A4 cheat sheet.
  - 40%: Project report—survey of a research problem, algorithm, theoretical framework, etc.
- **Textbook:** None.
- **References:** Lectures slides and pointers to literature.

Logistics

- **Schedule:** There will be in total *15 weeks*.
  - Midterm on November 18.
  - No lectures on November 4 & December 9.
  - Project presentations or a bonus lecture on December 30.

- **Office hours:** After class every Monday or by appointment.

- **TA hours:**
  - 何文劭: 17h00–18h00 every Wednesday.
  - 李威承: 17h00–18h00 every Thursday.
  - Place: Lab 407.

Policy

- Homework reports should be submitted online as pdf files. Photos and scans are fine.
- Late report submission $\Rightarrow$ Score $\times (1 - 0.05h)$.
- If you discuss with anyone when working on the homework, then put their name(s) in your report. Your reports should reflect your own understanding, and be written in your own words.
- *Cheating is not tolerated.* The first time leads to zero point for the corresponding *part* (homework/quiz, midterm, or project). The second time leads to *failing the course*.

Rules for submitting your homework

- *Only one pdf file will be accepted!* If your original file is not pdf, then transform it to a pdf one. If you have multiple pdf files, then combine them to form a single one.

- *Name your pdf file as "YourName ID_hw0_v0.pdf".* If you have multiple versions, name them all following the same rule and change the version number.

- *Write your name (as used on NTUCOOL)* in the upper-left corner on the first page of your homework report.

Features of this course

Motivation:

- Learning with high-dimensional & big data.
- Very biased according to the lecturer's preference.

Topics (*flexible*):

- First-order methods (gradient descent, mirror descent, etc.).
- Online learning and online convex optimization.

Methodology:

- Black-box/oracle model.
- Rigorous complexity analyses.

All information can be found here.

Course website:

`https://cool.ntu.edu.tw/courses/382` or
`http://bit.ly/csie5410`

Please make use of the on-line forum that supports LaTeX.