Optimization and Machine Learning for Particle Accelerators: organization of the course

Presenter: R. Lehe

Day 1

Team

Instructors:

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(SLAC)

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(LBNL)

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(SLAC)

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(SLAC)

Graders:

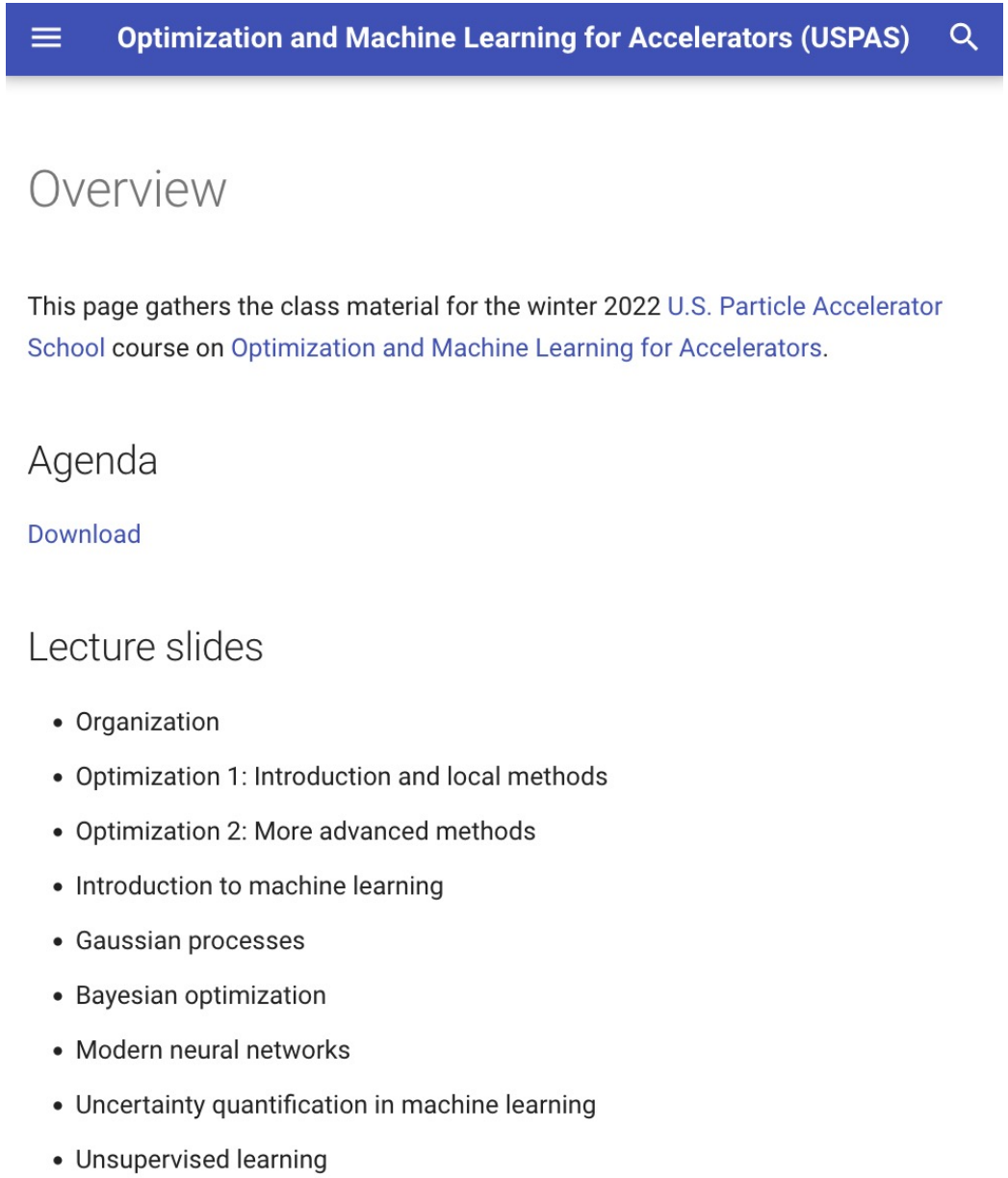
Jorge Diaz Cruz
(U. New Mexico)

Mauricio Ayllon Unzueta
(NASA Goddard Space Flight Center)

Course website

- Course website: https://slaclab.github.io/USPAS_ML

- Gathers resources for the course:
  - Agenda
  - Lecture slides (posted just before each lecture)
  - Lab solutions (posted after corresponding labs)
  - Slack workspace



Agenda

Time (CST time zone)	Monday January 24	Tuesday January 25	Wednesday January 26	Thursday January 27	Friday January 28
			Return homework from lab 1		Return homework from lab 3
10:00 AM	Lecture 1: Optimization 1	Lecture 2: Optimization 2	Lecture 3: Intro to machine learning	Lecture 4: Gaussian processes	Lecture 5: Bayesian optimization
11:00 AM	Break	Break	Break	Break	Break
12:00 PM				Gaussian processes	
1:00 PM					
2:00 PM	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5
	Homework from lab 1		Homework from lab 3		Homework from lab 5

Monday January 31	Tuesday February 1	Wednesday February 2	Thursday February 3	Friday February 4
Return homework from lab 5		Return homework from lab 6		Return homework from lab 8
Lecture 6: Modern neural networks	Lecture 7: Uncertainty quantification	Lecture 8: Unsupervised learning	Lecture 9: Reinforcement learning	Exam
Break	Break	Break	Break	Break
Lab 6	Lab 7	Lab 8	Lab 9	Lecture 10: Current challenges
Homework from lab 6		Homework from lab 8		

Connect to Zoom during the colored areas of the planning (see Google Calendar invitations)

Labs and homework

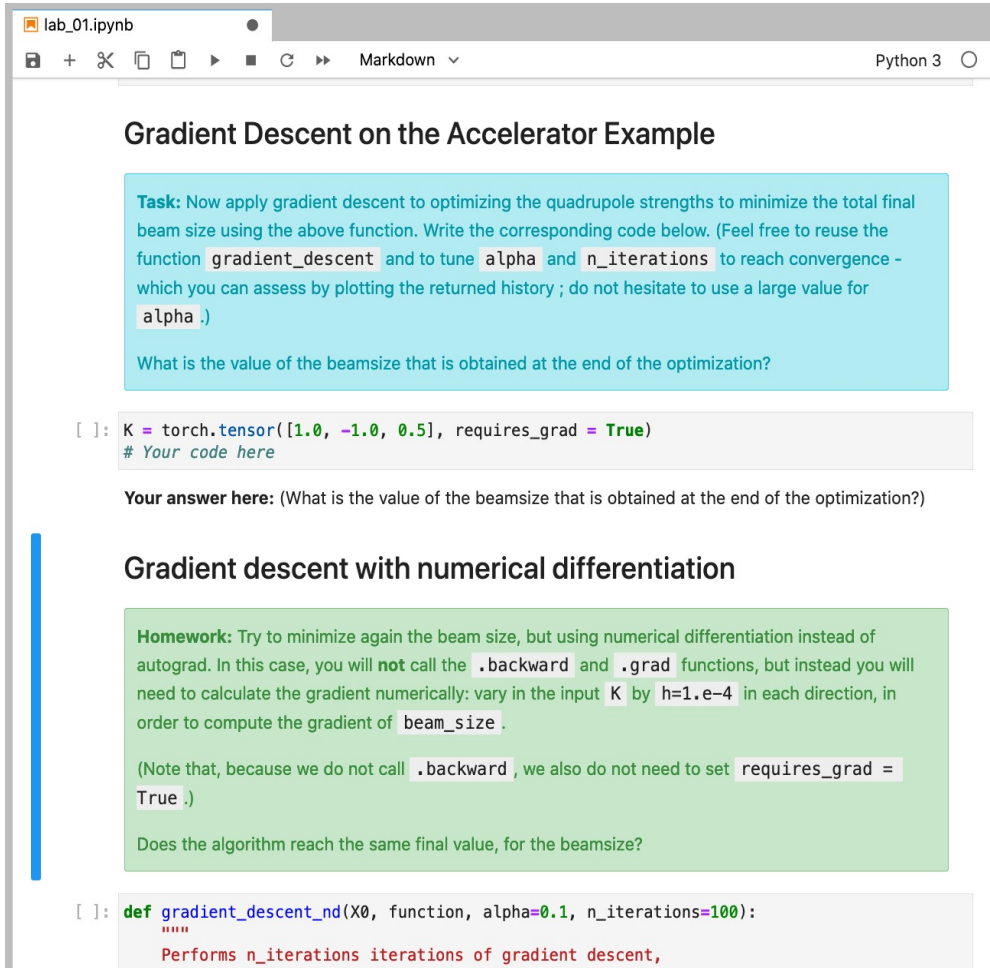
- Labs, homework and exam are in **Jupyter notebook** format.

- We will use Radiasoft's cloud platform "Sirepo" (www.sirepo.com/jupyter) to:
  - Run the labs in a controlled environment
  - Gather the returned homework

- When connecting to Sirepo for the first time: use **the email address that you provided to USPAS**

- **Blue questions:** done live, during lab sessions
  Green questions: homework

Note: When using Sirepo: no GPU access.
For (free) GPU resources, you can run the notebooks on https://colab.research.google.com/ after this course.
(Not supported during this course.)



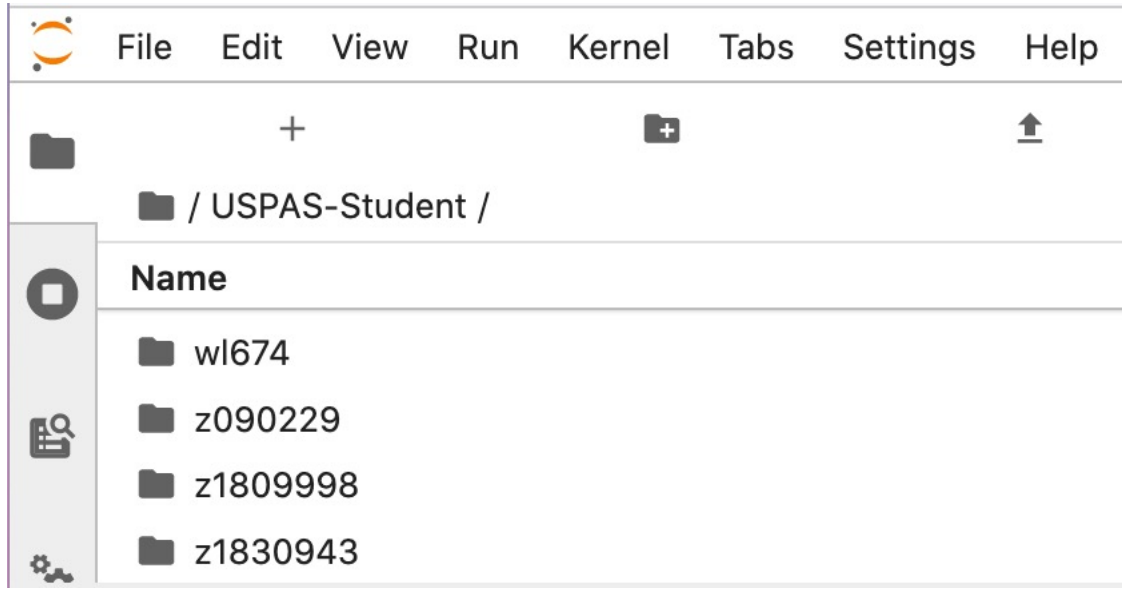
Grading

- Homework and final exam will be graded.
  Overall grade = 60% homework + 40% exam

- Need A or B to pass this course and
  get academic credits

- When done with your homework/exam,
  copy your notebook to the folder that
  corresponds to your **email address**,
  within the `USPAS-Student` folder,
  on www.sirepo.com/jupyter

- **Audit students:** no need to return
  homework or participate in exam.



Zoom

- Lectures, labs and exam will take place through Zoom.
  Lectures will be **recorded** and shared by private link through Slack

- Mute unless you are specifically asked to unmute (e.g. for questions)

- **Feel free to ask questions at any time during lab/lecture!**
  by either:
  - Raising your hand in Zoom
  - Or typing the question in the chat

- For questions outside of the lab/lecture sessions, use Slack (next slide)

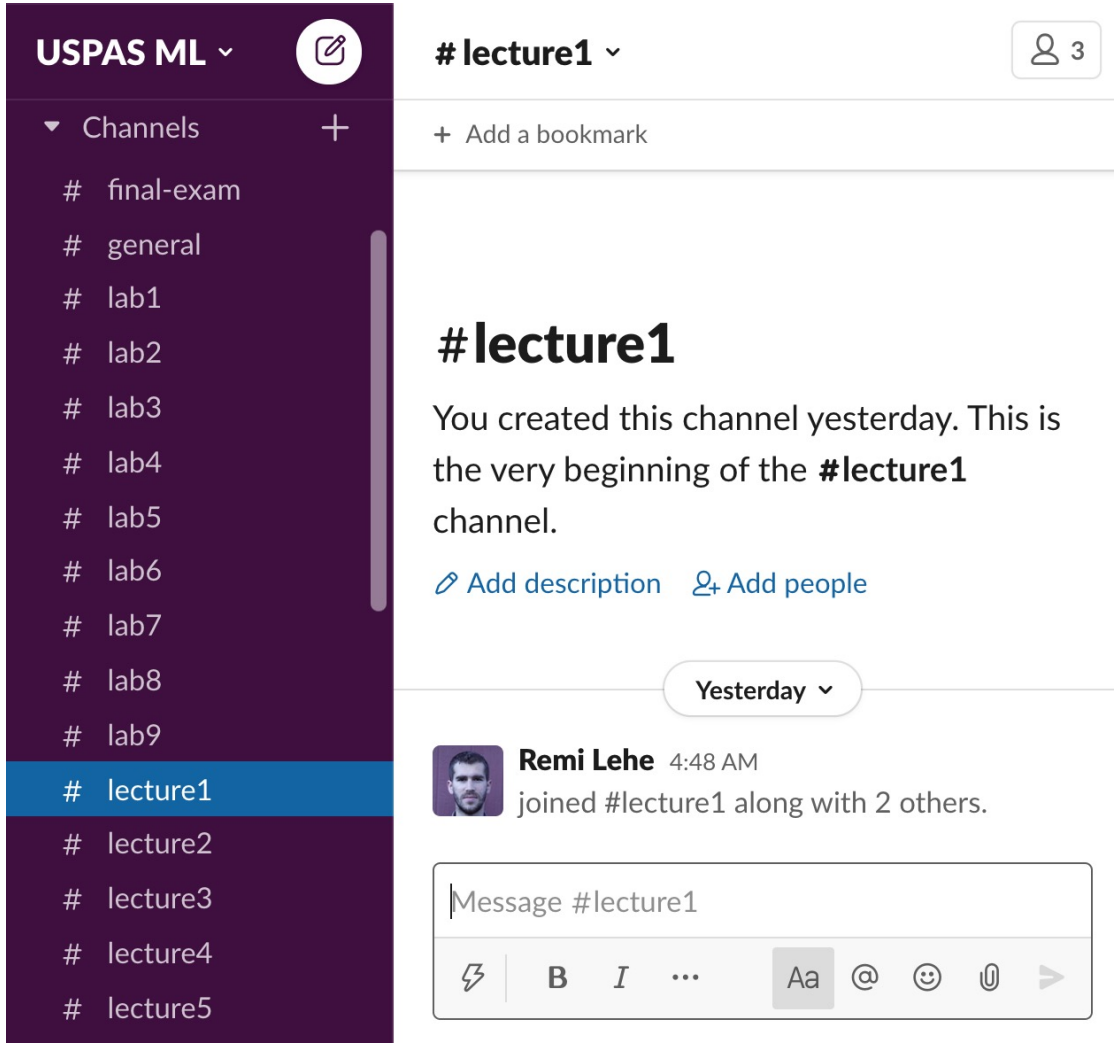
- Reminder: do not post Zoom link publicly ; link is only for registered students.

Slack

- Our slack workspace:
  uspas-ml-winter-2022.slack.com

- You should have been invited last week.
  If not: let us know **now** via Zoom chat
  (along with your email address)!

- Purpose:
  - interaction outside of lecture/lab hours
  - any questions (on course content or organization)
  - one-on-one help (esp. debugging your environment)
  - sharing interesting resources, etc.



Questions?

Any question at this point?