Fortgeschrittenenpraktikum Data Science
WiSe 24/25

Dr. Christoph Brauer

Institute of Lightweight Systems (DLR) / Institute of Analysis and Algebra (TUBS)

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

Technische Universität Braunschweig

ch.brauer@tu-bs.de

christoph-brauer-29b05214b

Personal Introduction CB

- Born 1985 in Stade (Lower Saxony)
- Married, 2 daughters
- 2004 Finished school
- 2004-2005 Military service
- 2005-2008 Bank employee
- 2008-2012 FWM BSc (TUBS)
- 2012-2014 Mathematics MSc (TUBS)

Personal Introduction CB (cont)

- 2014-2018 Mathematics PhD (TUBS)
- 2014-2023 Postdoc (TUBS)
- since 2018 Lecturer (TUBS)
  Machine learning with neural networks
  Fortgeschrittenenpraktikum data science
  Machine learning and aerospace applications
- since 2020 Scientific staff (DLR Stade)
- since 2022 Deputy head of department Production Technologies (DLR Stade)

Personal Introduction TdW

- since 2019 Professor at TU Braunschweig
  Department of Mathematics
  Institute of Analysis and Algebra
  Head of research group "Applied Algebra"

Course Overview

- From now on abbreviate

  FPDS

- Four hands-on projects

  0 Python introduction (wk 1)
  1 FCNNs (wk 2–3)
  2 CNNs (wk 4–6)
  3 RNNs (wk 7–10)
  4 DLR project (wk 11–14)

Project 0
Nothing to submit

Projects 1–3
Submit Jupyter Notebook
Maybe additional files
Defend solution

Project 4
Design solution from scratch
Submit model to competition
Create and present a poster

Preliminaries and Todos

- Inverted classroom principle, no teacher-centered teaching
- Material provided in Stud.IP under "Files" and "Courseware"
- Attendance generally not mandatory, but on the following occasions

Defense of solutions on Wednesdays at the end of projects
(15-minute time slots will be allocated in advance)

DLR project kick-off
Poster tutorial
Final presentation

Unexcused absence may result in failure

Preliminaries and Todos (cont)

- Form groups of two and enter into Stud.IP under "Participants"
- Do not let LLMs do your work (e.g., Chat GPT)
- Do not use cloud services like (e.g., Google Colab)
- Work on your own laptop, in the CIP-Pool, or use our GPU-cluster

Dates and Deadlines

- 16.10.2024 Kick-off FPDS
- 16.10.2024 Activation courseware Python introduction
- 21.10.2024 Activation courseware Project 1
- 06.11.2024 Submission deadline Project 1
- 06.11.2024 Defense Project 1 solution (mandatory)
- 04.11.2024 Activation courseware Project 2
- 27.11.2024 Submission deadline Project 2
- 27.11.2024 Defense Project 2 solution (mandatory)

Dates and Deadlines (cont)

- 25.11.2024 Activation courseware Project 3
- 18.12.2024 Submission deadline Project 3
- 18.12.2024 Defense Project 3 solution (mandatory)
- 18.12.2024 Kick-off DLR project (mandatory)
- January 2025 Poster tutorial (mandatory)
- February 2025 Final presentation and poster session (mandatory)

Regular Course Times

- Wednesdays 15:00-16:30 CIP-Pool
- Wednesdays 16:45-18:15 CIP-Pool
- Thursday 15:00-16:30 Online (prior registration in Stud.IP)
- Except for the mandatory dates, participation is optional
- You can submit topics in advance