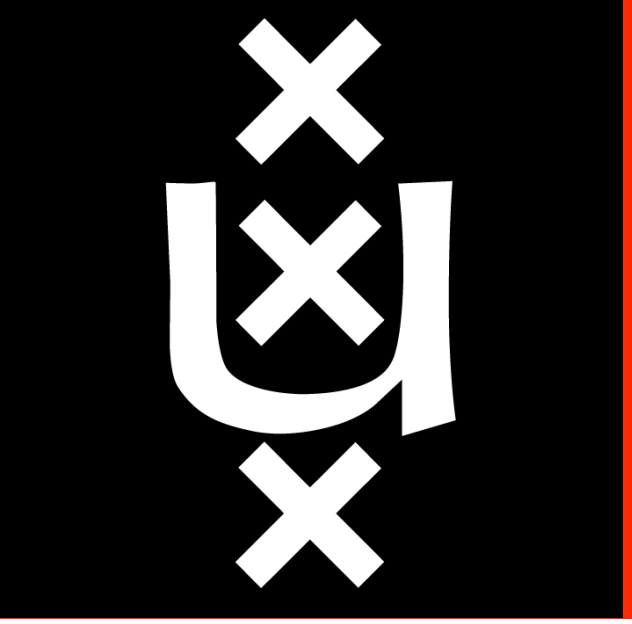

Christof Monz

Deep Learning for Natural Language Technology

Practical Mini Project

Practical Mini Project

- Work on **one** concrete NLP problem using a neural network approach
- Canvas course web page lists example problems and links to relevant data sets
  - but you can also choose your own problem (check w/ TAs)
- Work in teams of 5 students
- Before Monday, Sept. 10, 9am: each team sends one email to both TAs with
  - list all team members (full names, student IDs and emails)
  - for each team member list NN toolkit expertises (TensorFlow, PyTorch, ...)
  - the problem you choose to work on (if you choose your own, check feasibility with TAs during lab session in week 2)
- In weeks 6 and 7 each team gives a 15 minute presentation followed by 5 minutes for questions

Practical Mini Project

- Mini project runs from week 2–5;
- Deadline for submitting presentations/reports/code is Friday, October 5, 12:00 noon
- Suggested timeline
- This week:
  - choose your team
  - pick/come up with a problem
  - inform TAs
- Week 2:
  - identify and read relevant previous literature
  - inspect data, pre-preprocess, test/valid data
  - additional data crawling?
  - what should be the initial model?

Practical Mini Project

- Week 3:
  - implement first model
  - evaluate
  - debug?
  - what works, what doesn't?
- Week 4:
  - refine first model/try alternative model
  - bells and whistles (dropout, layernorms, more layers, residual, highway connections, etc.)
  - evaluate and compare
  - what works, what doesn't?

Practical Mini Project

- Week 5:
  - refine second model/try (another) alternative model
  - error analysis, open problems
  - conclusions, recommendations
  - write 4 page report with main findings
  - prepare slides for presentation
- By Friday, October 5, 12 noon, **each** team submits:
  - your team's short report (approx. 4 pages) in PDF
  - your team's presentation slides (as PDF or PowerPoint)
  - your code including a readme file (how to run your code)
    - as link to Github repo (preferably) or gzipped tarball
    - if (gzipped) data is <10MB you can include it, otherwise provide link
- Team presentation slots (for weeks 6–7) will be assigned at the beginning of week 5

Practical Mini Project

- Lab sessions:
  - Monday 9-11am (two rooms); weeks 2–5
  - No labs on Tuesdays (1-3pm), unless really, really needed
  - opportunity to ask TAs questions about your project progress/problems/pointers/feedback on ideas...
  - each team sends two representatives to the lab sessions
  - which room should a team go to?

Practical Mini Project

- Some practical advice
  - keep the data small, most likely, you'll be running it on your laptop
  - if the data is too big, down-sample, select based on some criteria (vocab, classes, length), ...
- What makes a good mini-project?
  - good succinct description of the most relevant research papers
  - good description of the data preprocessing/settings
  - good motivation of the neural architecture choices
  - thorough evaluation (scores under different settings/architectures); error analysis
  - report that focuses on the most relevant findings: what (doesn't) work and why
  - good presentation focusing on the most important aspects and finding, understandable by wider audience, contains examples

Practical Mini Project

- Pimp up your (seemingly simple) mini project
- Example: language identification
  - literature: what has been tried (neural and non-neural)?
  - process input: words, characters, character n-grams?
  - baseline model: word embeddings (week 2); how to combine embeddings; additional hidden layers?
  - run evaluations: e.g., accuracies? (check literature)
  - better model?: CNN sequence classifier (week 3) (how to pool; strides. etc.)
  - more evaluation (literature mentions problem of short inputs)
  - more evaluation (literature mentions problem of languages close to each other)
  - applications: e.g., instant translation, question: what are accuracies after n characters?
  - ... continues on next slide

Practical Mini Project

- Pimp up your (seemingly simple) mini project
- Example: language identification
  - ... continuation from previous slide
  - crawl/use more data; how can we use script information (UTF-8 regions) in an NN?
  - even better model? RNN sequence classifier (week 3/4)
  - evaluation: other tricky cases: e.g., code-switching?
  - best overall evaluation: accuracies, precision/recall, ... ?
  - how best to show findings: score tables; visualizations; clusters?
  - looking back what really makes a difference?
  - anything that contradicts previous literature (bug or finding)?

Practical Mini Project

- Teaching assistants (TAs)
  - Praveen Dakwale: P.Dakwale@uva.nl
  - Hamidreza Ghader: H.Ghader@uva.nl
- All communication with TAs in English