

DSME project FLOOD - introduction

- motivation → numerical models expensive for real-time simulations + flood risk assessment. ⇒ accelerate numerical modeling with deep learning.
- problem formulation
 - predict spatio-temporal evolution of water depth + velocity / discharges.
 - generalize for unseen landscape
 - model has to be faster than numerical one
- dataset → only thing that changes is topography
- deep learning models
 - CNN (U-Net style)
 - Conv-LSTM
 - GNN (tricky)
 - other (physics-informed neural networks)
- expected outputs (plots):

DEM	Ground truth h	predicted h	difference d
	q	q	q
- possible issues
 - accumulation of errors $x^{t+1} = f(x^t)$
 - one step forecast → inconsistency between consecutive time steps
- GitHub repository → complicated
- LOS - i) motivate choices, ii) defend opinions, iii) cater to diverse audience, iv) evaluate feedback.
- 2nd dataset: varying breach location
- 5th dataset: larger domain
- coding problems / bugs → contact TA
- write small workplan + set date goals + list of activities

use of activities.

- deliverables : small report → explain what/why you did + small introduction + repository.
 - use .py files to store large functions
 - try to keep organized
- task division
 - pre-process data + normalization
 - multiple DL models
 - performance metrics
 - use shared repository
 - create shared repository during collaborative coding workshop ⇒ use Github desktop ⇒ easy to see modifications.
- mid-term : start working on every part of project + create repository, simple codes that does not work... but does run + ideas on how to improve. ⇒ show short PowerPoint/summary to show progress

