

Deep Learning in Statistics: Practical Challenges

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May 31, 2021

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1. Challenge 1: How to run DL models?
2. Challenge 2: How to gain expertise?
3. Challenge 3: How to keep up with developments?

Challenge 1: How to run DL models?

1. Several options:, depending on size of problem & resources
 - 1.1 Free cloud computing: Colab, etc
 - 1.2 Local: personal computer (CPU/GPU), server
 - 1.3 Paid cloud
2. Software - fast evolving
 - 2.1 PyTorch, TensorFlow
 - 2.2 wrappers: JAX, Keras
 - 2.3 interfaces: Jupyter notebooks

Challenge 2: How to gain expertise?

1. Our short course
2. Online courses: Coursera's `deeplearning.ai`, Stanford Classes (CS231N, CS224N), DeepMind x UCL, ENS/Ecole Polytechnique ¹
3. In-person courses at university
4. Online materials: tutorials - search!
5. Many papers have GitHub repositories with code (search for popular repos, curated lists like <https://github.com/mbadry1/Top-Deep-Learning>)
6. Books?

¹See resources collected at my course website:

Challenge 3: How to keep up with developments?

1. Tutorials: at conferences (NeurIPS, ICML, ICLR, AISTATS)
2. Attending conferences
3. Summer schools: video lectures on advanced topics (MLSS, EEML)
4. Review papers: LeCun et al 2015, Schmidhuber 2015; statistical: Yuan et al 2020, Fan et al 2021
5. Papers: influential papers (citation count), arxiv (firehose! need filter like arxiv-sanity.org)
6. Other online sources for real-time updates: Twitter, blogs (Google, DeepMind)
7. Online seminar series: One World ML, DL: Classics and Trends
8. Theory: Programs at Simons Institute, IAS; course materials by leaders