Deep Learning for Trivial Inverse Problems

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Aims

Investigate approximation of a pseudo-inverse by a neural network on a prototypical example of an ill-conditioned 2x2 matrix. Understand when the neural network fails to approximate a pseudo-inverse and if/how correct behaviour can be restored.

objectives

1. Understand the approach taken in P. Maass “Deep Learning for Trival Inverse Problems”.
2. Reproduce the results obtained in the paper.
3. Use alternative approaches for the same problem.
   e.g. training with regularised data, different network architectures, using orthogonal coefficients to force robustness

Expected outcomes/deliverables

1. A final report documenting the data, methods, results used in the project,.
2. The code of different deep models used implemented in the project

Work plan

• Project start to end mid-November(2 weeks) Research and reading.
• Mid-November to mid-December(4 weeks) Recreate the experiment results in the paper
• Mid-December to Mid-January (4 weeks) Explore new approaches to for the same problem
• Mid-January to mid-February (4 weeks) Interim Report
• Mid-February to end of March (6 weeks) Work on Final Report