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Math 189R The Mathematics of Big Data

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Paper (Neural Expectation Maximization): <https://arxiv.org/pdf/1708.03498.pdf>

Github repo: <https://github.com/sjoerdvansteenkiste/Neural-EM>

Neural Expectation Maximization Paper Reading Summary

This paper deals with the task of identifying clustered objects in images, using a spatial mixture model where each component is parametrized by a neural network. The Expectation-Maximization algorithm is used to derive a clustering method that can group objects together and identify individual components. The E-step works by computing a new estimate of the posterior probability distribution over the latent variables, which gives a new soft-assignment of the pixels to the component clusters. The M-step uses gradient ascent to find the configuration of θ that maximizes the expected log-likelihood using the posteriors computed in the E-step. The paper discusses the mathematical model for these steps, then illustrates how the implementation performs on a few datasets of shapes, as well as the MNIST character recognition dataset.