Tensor Approximation Journal

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November 10, 2015

0.1 October 13th, 2015

This past week, I spent a few hours reading about simple algebraic topology to understand the question Dr. Mohlenkamp posed to the exploratory members. While I wasn't able to answer the question, I was able to make more sense of what was being asked after some reading some introductory topology.

0.2 October 20th, 2015

This past week, I spent some time investigating the different articles in the Sage DSoTA project. Mainly, I read skimmed through The Optimization Landscape for Tensor Approximations working article. However, due to midterms, I was only able to briefly skim through the material. The table of content alone is a great help. Reading it allowed my mind to filter different topics and areas of the problems into "boxes." I also skimmed through the Dynamical Systems on Tensor Approximations paper, which definitely helped gain some insight into the scope and approaches to align with.

0.3 October 27th, 2015

I read On the Global Convergence of the Alternating Least Squares Method for Rank-One Approximation To Generic Tensors, by Liqi Wang and Moody Chu for my Numerical Analysis course this week. The paper poses a proof that almost all rank-one generic tensors have a High-Order Power Method (HOPM) which globally converges. Following Dr. Mohlenkamp's advice, I skimmed through a stronger result in A New Convergence Proof for High Order Power Method And Generalizations, found on the DSoTA page, proving all rank-one generic tensors have a HOPM which globally converges. I've also started reading Steven Strogatz' Nonlinear Dynamics and Chaos to learn about some different gradient flows and their properties.

0.4 November 3th, 2015

Last week, Dr. Mohlenkamp presented on a method for measuring qualitative properties of gradient flows. In his discussion, he presented upon using $S(x) = \frac{f(x)}{||f'(x)||_2^2}$ as a measure. In his talk he brought up three different developments and posed the idea of using $S(x)$ with adaptive step size to iteratively pass over swamps faster.

0.5 November 10th, 2015

This last week, due to the interesting research Xue has been reporting on in weekly journals, I started to briefly read up on pieces of the swamp.pdf file in the DSoTA project folder. I still am not completely confident in my understanding of the paper, but I plan on devoting some time in the upcoming week to give the paper a full, proper reading.