Motivation

An example: classification of ADHD infected brain image and normal brain image:

![Image of brain images]

Support Tensor Machine: Binary Classification

Model for Small Sample Size:
- Binary Classification $\rightarrow x$ - input (all the data points), $y$ - output $(-1, 1)$
- Learning Model $\rightarrow$ Support Vector Machine (SVM)
- Nonlinear Boundary $\rightarrow$ Projection into higher-dimensional space

![Diagram of SVM vs. STM]

Conclusions and Outlook

- Low rank method: Exact TT-CP Expansion
- Kernel model for less data with higher dimensions
- Approximating kernel not only reduced cost, also increases accuracy
- Stability and computational cost

Tools and Codes:
- TT-Toolbox by Ivan Oseledets and Sergey Dolgov: https://github.com/oseledets/T-Toolbox
- LIBSVM by Chih-Jen Lin: http://www.csie.ntu.edu.tw/~cjlin/libsvm

Selected References

