CO316 – Course Projects

Course projects are in teams of size not more than 2.

A list of papers is provided. A team is to choose one for implementation. You are free to choose any paper from a top conference/journal for this project – this will need Instructor approval before going ahead.
Project objective: Reproduce the algorithm+implementation from the paper. Use a standard input data set (usually mentioned in the paper) to run your implementations.
For bonus: Innovate in your implementation. Compare performance (and other relevant metrics) with the paper's, and with the ones presented in the Related Work in the paper.

Project Milestones

M1 – Proposal Submission (Oct 26). 15% of project weight.
Include in the Project proposal: Problem statement, Project execution plan (implementation framework, inputs, expected outputs, metrics to measure, and other relevant info), Project timeline, Work Distribution among teammates. Up-to-date progress report. Max 4 pages.

M2 – Final report submission. Nov. 15.
Include in the Final Report: List of objectives achieved, Results. Merge with previous report. Final report should not be above 8 pages.

M3 (optional) – After the project: Talk to me if you think you deserve bonus or if you wish to convert your work into a conf/journal submisison. This will involve committment outside your coursework to fix missing gaps in your paper and will require extra work in the experiments.

Format all reports using the IEEExplore latex template - https://www.ctan.org/tex-archive/macros/latex/contrib/IEEEtran/?lang=en. Use the bare_conf.tex template.

List of Papers.

1. High-performance Cholesky. factorization for GPU-only execution
http://www.icl.utk.edu/files/publications/2017/icl-utk-987-2017.pdf
2. Maggioni and Berger-Wolf, Optimization techniques for sparse matrix – vector multiplication on GPUs, J. Parallel Distrib. Comput. 93–94(2016)66–86. Click here for paper: Link
3. Tan et. al., Fast Implementation of DGEMM on Fermi GPU, Supercomputing, 2011.
http://www.ncic.ac.cn/~tgm/images/1/18/SC11.pdf
4. Rawat, et. al., Register optimizations for stencils on GPUs. PPoPP '18. DOI:
https://doi.org/10.1145/3178487.3178500
5. Parallel Tensor Compression for Large-Scale Scientific Data. https://prod.sandia.gov/techlib-noauth/access-control.cgi/2015/159205r.pdf
6. Hayashi, et. al., Shared Memory Parallelization of MTTKRP for Dense Tensors,
https://arxiv.org/pdf/1708.08976.pdf
7. Blelloch, et. al., Sequential Maximal Independent Set and Matching are Parallel on Average. SPAA, 2012.
https://people.csail.mit.edu/jshun/mis.pdf. Ppt- https://people.csail.mit.edu/jshun/6886-s18/lectures/lecture14-2.pdf