CSCE 643 Final Project Requirement

There are three types of projects that you can choose from:

- New design: design a new system that is based on the vision techniques.
- Research projects: if you can connect the course content to your research, then you may generate a reasonable project topic.
- Implementing one of the following papers or a paper that is approved by me. Note: if authors provide source code, please do NOT use it. You project will be F if you directly use authors' source code. However, you may use it for comparison purpose after your finish your implementation. The candidate paper list is:

    1. R. Mohr, L. Quan, and F. Veillon Relative 3D Reconstruction Using Multiple Uncalibrated Images The International Journal of Robotics Research December 1995 14: 619-632
    2. Kai Ni; Steedly, D.; Dellaert, F., "Out-of-Core Bundle Adjustment for Large-Scale 3D Reconstruction," Computer Vision, 2007. ICCV 2007. IEEE 11th International Conference on , vol., no., pp.1,8, 14-21 Oct. 2007
    3. Marc Pollefeys, Reinhard Koch, LucVan Gool, "Self-Calibration and Metric Reconstruction Inspite of Varying and Unknown Intrinsic Camera Parameters," International Journal of Computer Vision, Vol. 32, No. 1, Aug. 1999, pp. 7-25.
    4. Daniel Scharstein and Richard Szeliski, "High-accuracy stereo depth maps using structured light," IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR) 2003
    5. Shree K. Nayar and Tomoo Mitsunaga, "High Dynamic Range Imaging: Spatially Varying Pixel Exposures", IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR) 2000
    6. Andrew J. Davison, Ian D. Reid,Nicholas D. Molton, and Olivier Stasse, MonoSLAM: Real-Time Single Camera SLAM, IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, VOL. 29, NO. 6, JUNE 2007
    7. Nistér, David and Naroditsky, Oleg and Bergen, James, "Visual odometry for ground vehicle applications," Journal of Field Robotics, vol 23,no. 1, pp. 3-20, 2006
    8. E. Mouragnon, M. Lhuillier, M. Dhome, F. Dekeyser, P. Sayd, Generic and real-time structure from motion using local bundle adjustment, Image and Vision Computing, Volume 27, Issue 8, 2 July 2009, Pages 1178-1193
    9. Richard I. Hartley, Self-Calibration of Stationary Cameras, International Journal of Computer Vision, Volume 22, Issue 1, pp 5-23, February 1997.

10. Kuthirummal, S.; Jawahar, C.V.; Narayanan, P. J., "Video frame alignment in multiple views," Image Processing. 2002. Proceedings. 2002 International Conference on , vol.3, no., pp.III-357,III-360 vol.3, 2002
11. Jonathan Kelly and Gaurav Sukhatme, Visual-Inertial Sensor Fusion: Localization, Mapping and Sensor-to-Sensor Self-calibration, IJRR, January 2011 vol. 30 no. 1 56-79
12. Gabe Sibley et al., Vast-scale Outdoor Navigation Using Adaptive Relative Bundle Adjustment, The International Journal of Robotics Research July 2010 vol. 29 no. 8 958-980

The project proposal should be submitted using the Google Classroom. The project proposal should be less than half page indicating what type of project that you want to do. For new design or research topics, the proposal should clearly states your goal and the proposed work. If you choose to implement an existing paper, please let me know that paper title, url to the paper, or id (if from the list above). Project proposals will not be graded. However, only approved project proposal can be accepted as final project topic.

The final project presentation will be 15 minutes (in-class) which include a 10-minute presentation and a 5-minute Q&A. The presentation schedule will be announced on the class website later. The project presentation and slides will count as 22.22% for the project score with half on presentation and half on the slides.

The final project report will be due on the Dec. 3 (5pm). The project report/package will also be submitted via turnin under CSNET. Please include the following:

- presentation slides (Note: the presentation grading will be based on presentation rubric and slides. 22.22%)
- source code and instructions for compiling (22.22%)
- report in pdf format (55.56%)