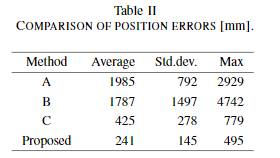
Paper Review of Cheng by 06/19/2020

* Title: Extrinsic Camera Parameter Estimation Using Video Images and GPS Considering GPS Positioning Accuracy
* Needs
  + GPS positioning errors can easily reach more than 10m, these errors will be affected by the satellite's position and environmental conditions.
  + If only the image is used for SfM operation, the final result has accumulated errors, and 3D reconstruction cannot be achieved perfectly.
* Objectives
  + In order to reduce the cumulative error, in addition to the video image, some reference points or external sensors are used to support, like GPS.
  + The results of these two different methods need to be integrated and researched together.
  + Need to find a way to solve the problem of GPS accuracy.
* Methodology
  + The author devises a method to use GPS information to optimize the location of the object locally before SfM modeling of each frame of image
  + After each local optimization at a specific time interval, a global optimization is also performed to reduce the cumulative error.
  + By introducing reprojection error and the penalty term, authors designed the energy function that could fuse the position data of the target in the image with GPS data to improve the accuracy of GPS data
* Results

The authors made an experiment, comparing the introduced function with three previous conventional methods. And as the results show, the proposed method is more accurate which has much less error.



* Conclusion
  + The authors of this article propose a function to fuse GPS data and image data to improve the accuracy of determining the object location.
  + Continuously adjust 3D modeling through local and global optimization.
  + The experimental results show that compared with the traditional method, the result position of the hybrid estimation method is more accurate.