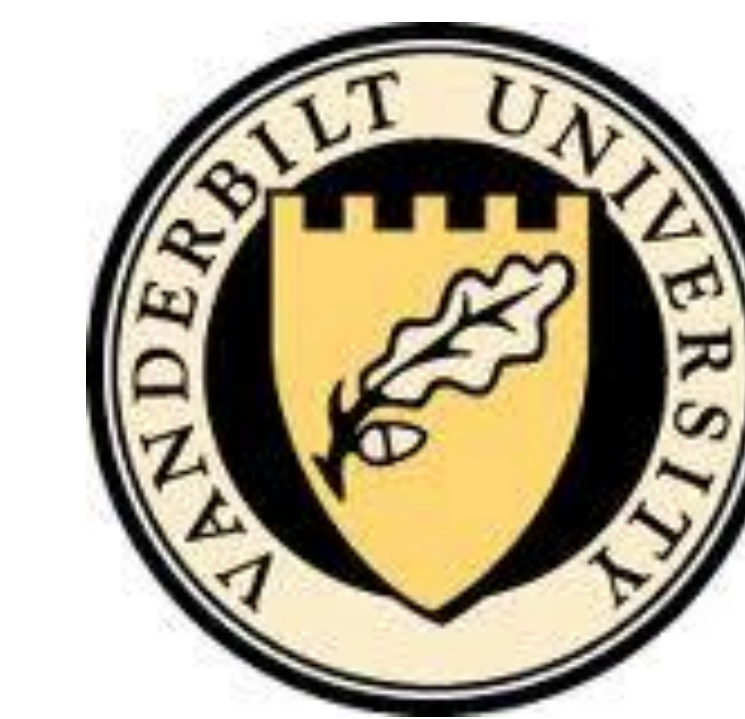


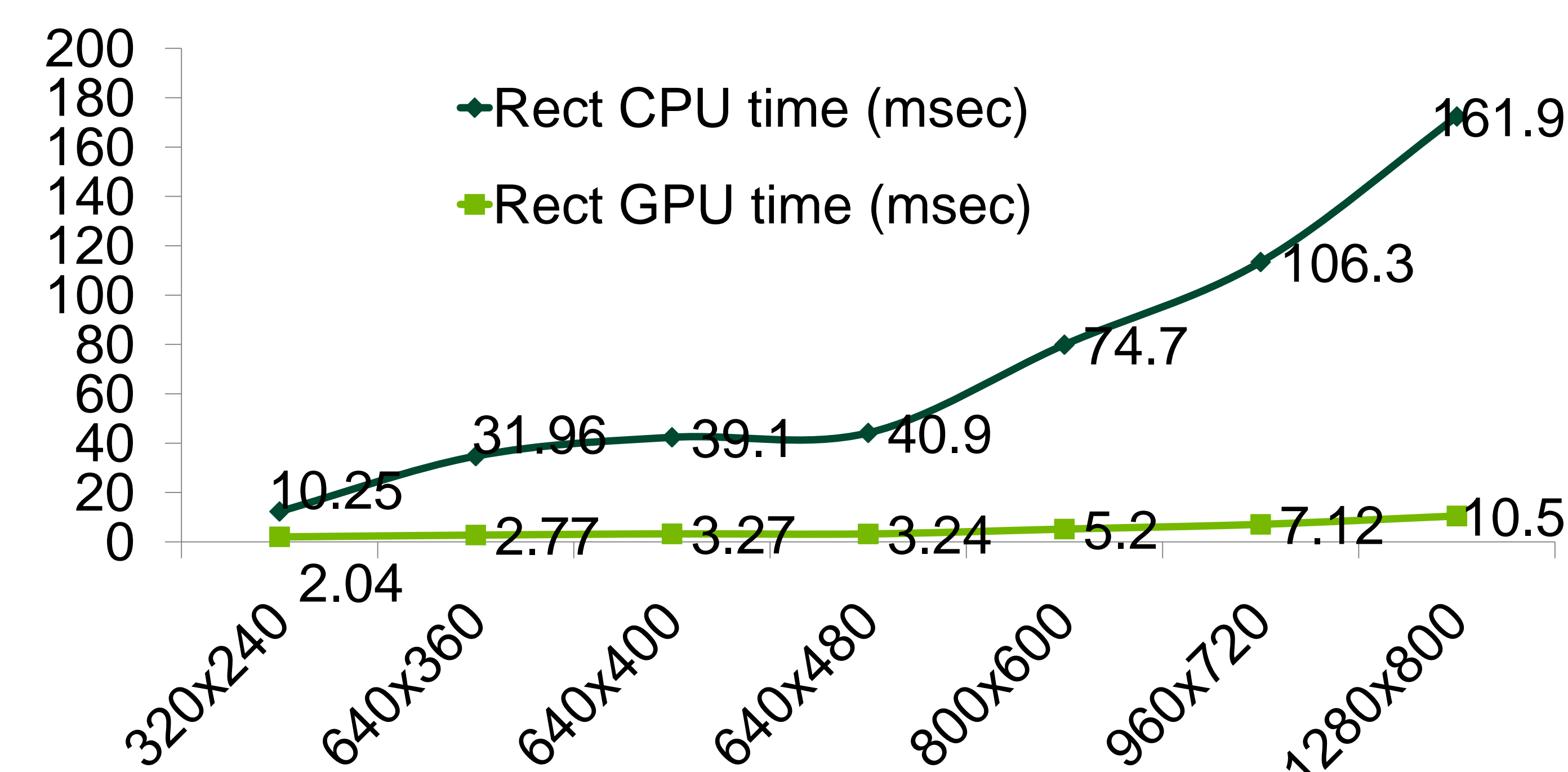
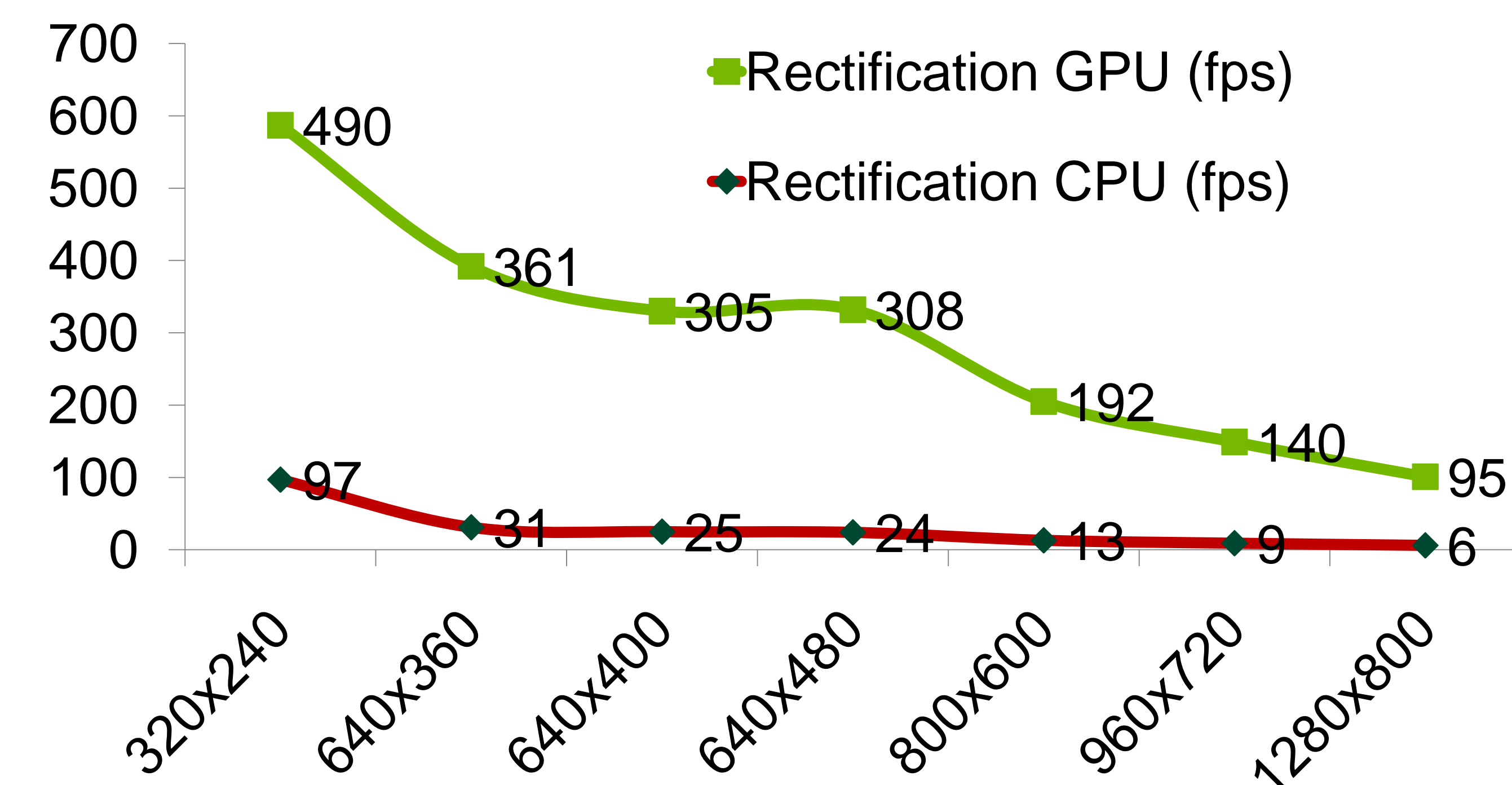
Dense Stereo Vision on GPU

Peters II, R. A.
Universal Robotics Inc.

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Run time comparisons

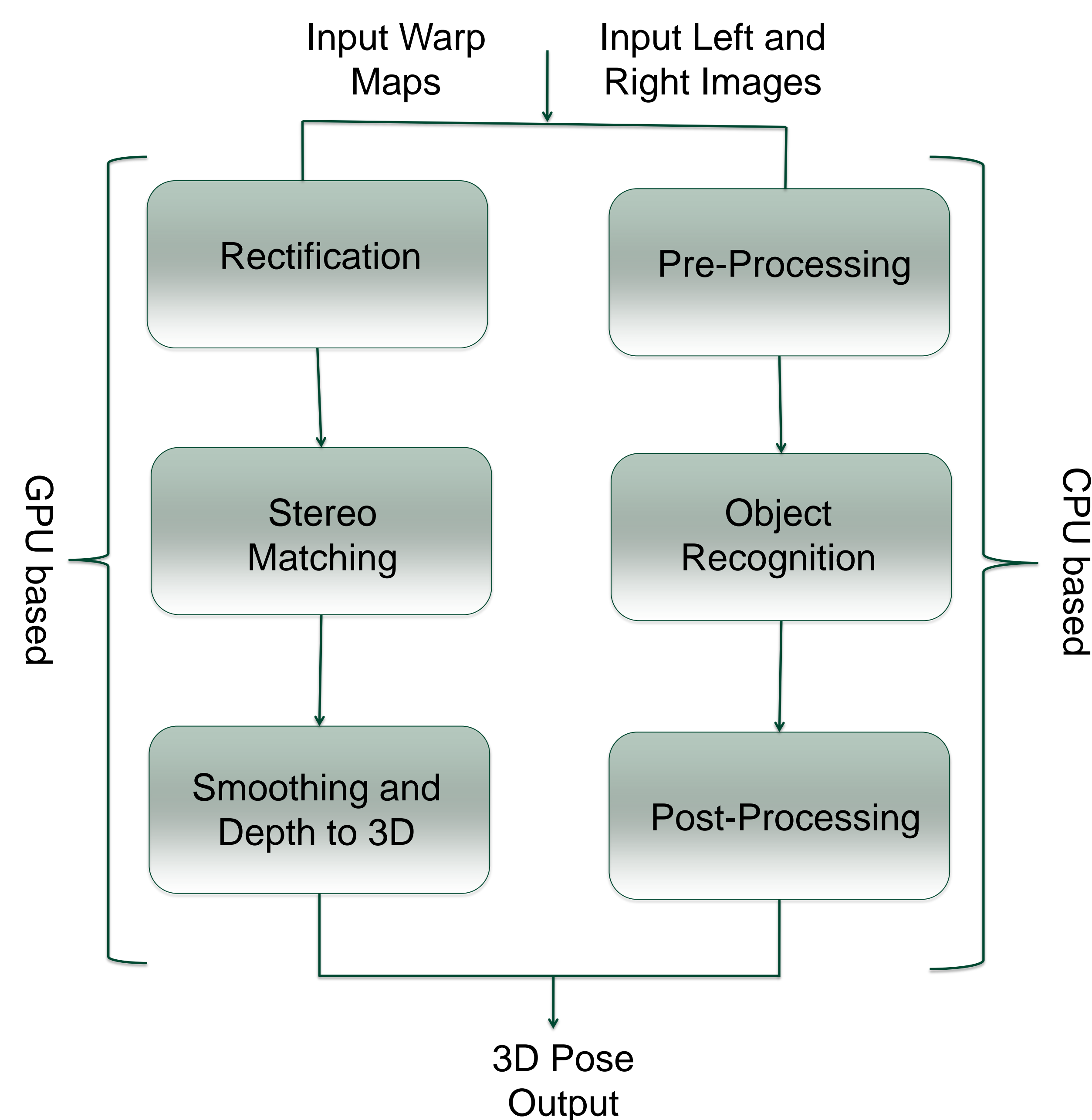


Reference

[1] Myron Z. B., Darius Burschka, *Advances in Computational Stereo*, PAMI, vol 25 no 8, Aug 2003

System Overview

- Rectification (warp) maps computed offline.
- Rectification and SSD based Block Matching (BM) on GPU.
- Peak filtered SSD min from a scan line.
- Consistency check and outlier rejection.

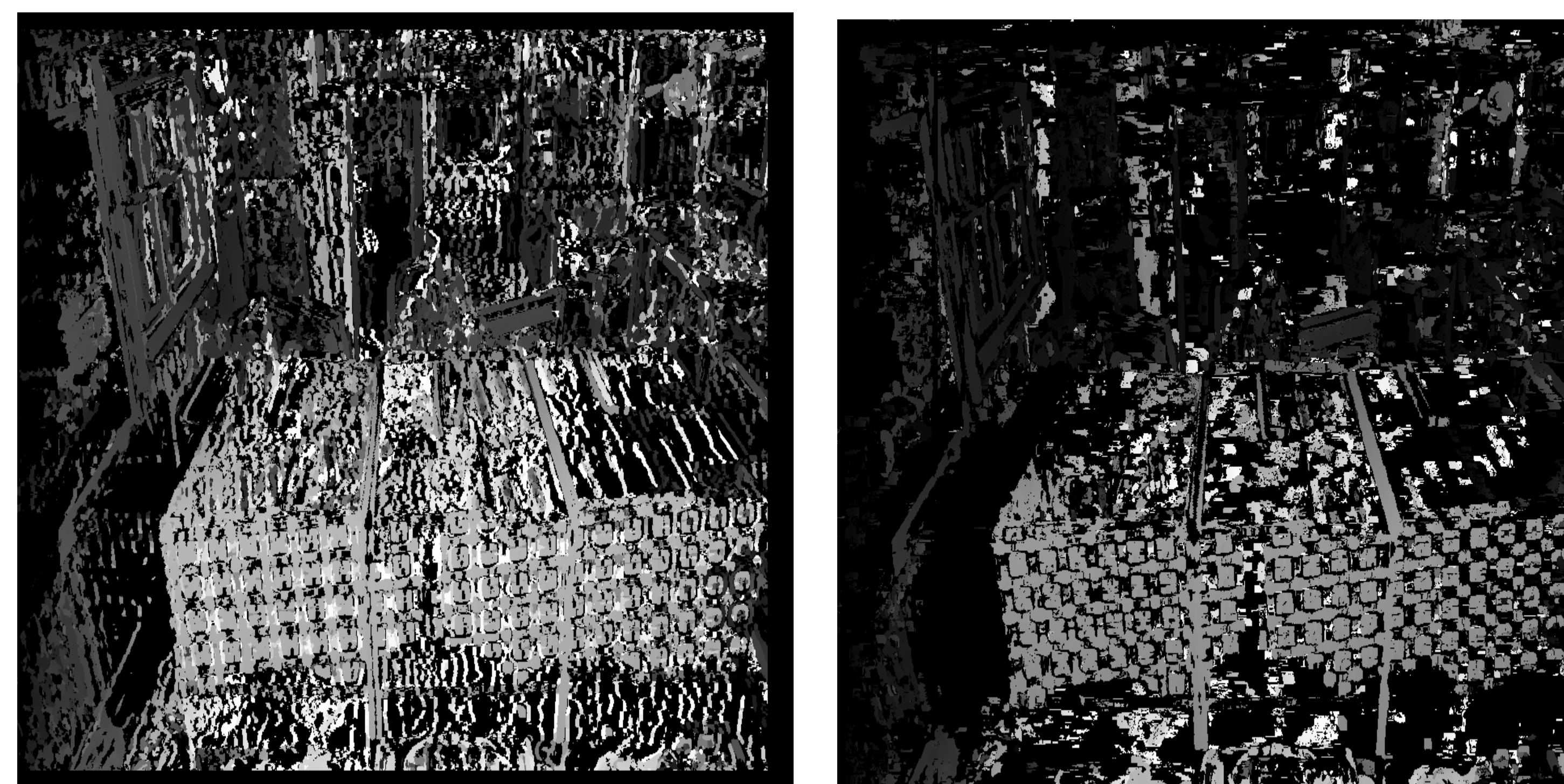


Results



Left Input Image

Right Input Image



CPU disparity (no peak filter)

GPU disparity (with peak filter)

Resolution	GPU	
	time (ms)	fps
320x240	5.15	194
640x360	15.5	64
640x400	17.6	57
640x480	20.9	48
800x600	33.05	30
960x720	47.6	21
1280x800	70.7	14

Comparisons:

- CPU rectification uses highly optimized Intel performance primitive remapping function.
- CUDA code executed on GeForce GTX 280.
- CPU code executed on Intel quad core 3GHz.
- GPU Stereo near real-time for 960x720 frame.
- Order of magnitude speed up over CPU.