

Bachelor Project Title and Summary

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- Co-Advisors: Diego Rossinelli, Patrick Zulian
- Title: Spectrally accurate resampling of rotated images.

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- Objective: Accurately rotate high quality 2D and 3D images. Possibly also be able to run on GPU using CUDA or MPI.

Plan

Week	Activity	Duration in Weeks	Status
W1	Finish all 2D image rotations in C and start rotations with CUDA.	1W	COMPLETED
W2	Complete 2D Rotations with CUDA and read/fully understand research article "Convolution-based Interpolation for fast, high quality Rotation of Images."	1W	DONE. CUDA rotations are not complete for gather no loss. Need to understand better when you can call kernels and where.
W3	Meet and ask questions about research article, keep learning paper. Finish gather no loss in C, keep looking at CUDA examples.	1W	Started summarizing the article and also a reference book about digital signal processing, which is helping a lot in understanding the article. DONE
W4	Fully implement CUDA code for gather no loss and fully understand article.	1W	Able to implement CUDA code for gather no loss still need this week for article. DONE
W5	Plot a sinusoid function around multiple circles to create a test image to serve as test for rotations. Understand how to translate an array by a fractional value	1W	IN PROGRESS
W6	Progress Report , start writing report, start with abstract. Continue with translate signal.	1W	IN PROGRESS
W7	Start implementing interpolation using 3 pass algorithm in 2d test image	2-3W	PLANNED
W8	Continue implementing interpolation using 3 pass algorithm in 2d test image and start looking into parallelizing the code with either MPI or CUDA	1W	PLANNED
W9	Continue implementing interpolation using 3 pass algorithm in 2d test image	1W	PLANNED
W10	Testing, improving... and finish report	2-3W	PLANNED
W11	Testing, improving... and finish report	1W	PLANNED
W12	Testing, improving... and finish report	1W	PLANNED