

## >>> Bicubic Interpolation

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# >>> Table of Contents

1. Problem Statement

2. Block Diagram

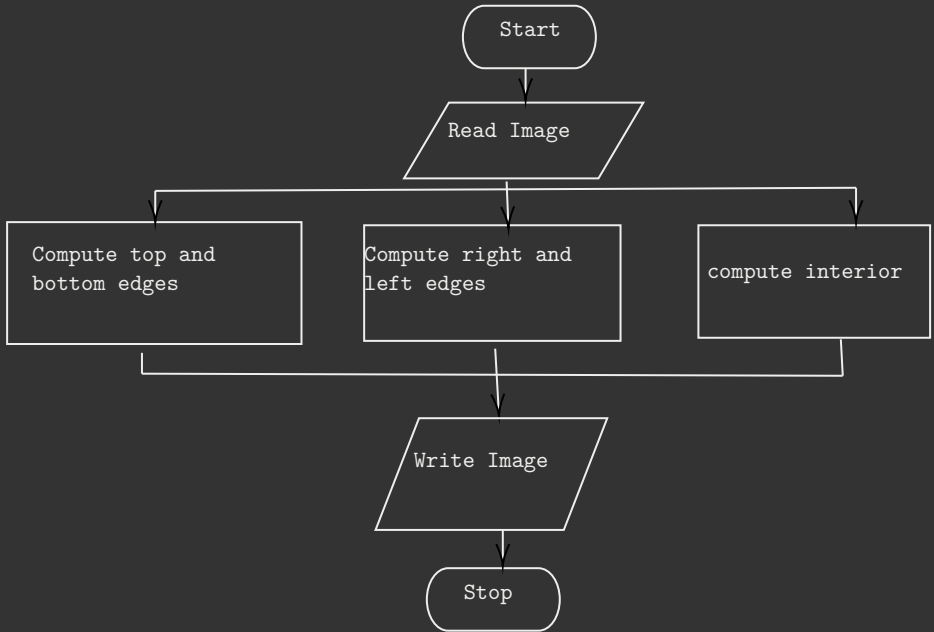
3. Progress and Plan

4. References

## >>> Problem Statement

- \* Bicubic interpolation is a method used in computer graphics and image processing to estimate values between grid points by considering a 4x4 pixel neighborhood and applying a cubic polynomial for smoother and more accurate results.
- \* It uses a cubic polynomial for smoother results in tasks like image resizing.
- \* My favorite emulators use it for upscaling.

## >>> Block Diagram



## >>> Progress and Plan

- \* Completed: Sequential and OpenMP implementations
- \* TODO: CUDA implementation (Soonish?) and optimise other two.

Sequential(CPU)	0.026749s
OpenMP	0.004811s
CUDA	Not done yet

**Table:** 540p to 1080p on 4600H(12 threads) and GTX 1660Ti

## >>> References

- [1] Gary Bradski and Adrian Kaehler. *Learning OpenCV: Computer vision with the OpenCV library*. " O'Reilly Media, Inc. ", 2008.
- [2] Paul Breeuwsma. *Cubic Interpolation*. Nov. 2016. URL: <https://www.paulinternet.nl/?page=bicubic>.
- [3] Computerphile. *Bicubic Interpolation*. Nov. 2016. URL: [https://www.youtube.com/watch?v=poY\\_nGzEEWM](https://www.youtube.com/watch?v=poY_nGzEEWM).
- [4] OpenMP Consortium. *OpenMP API Specification Version 5.2*. Nov. 2021. URL: <https://www.openmp.org/specifications/>.