OOP PROJECT

IMAGE STITCHING

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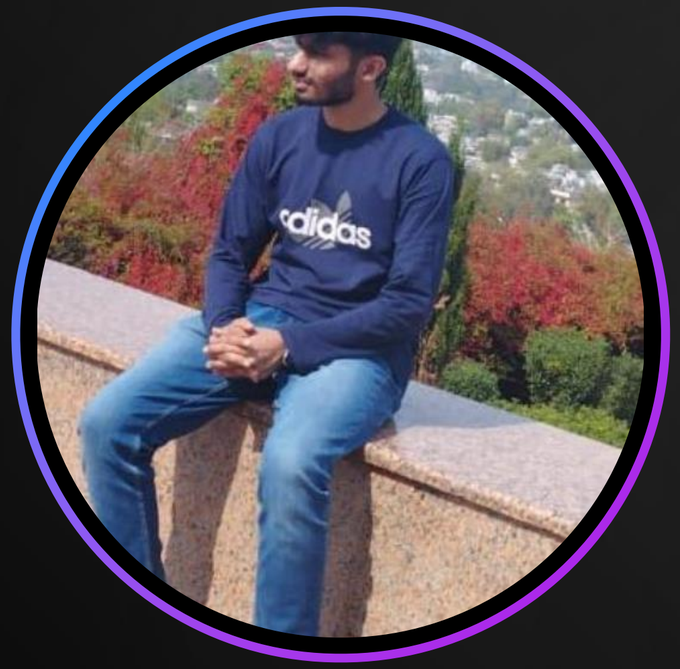
Team Members



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Overview

- *Why image Stitching*
- *Project Implementation*
- *Explanation of software*
- *Project Flowchart*
- *Libraries*
- *Project Folder Tree*
- *Algorithms*
- *Demo*
- *Github Repo*

WHY IMAGE STITCHING?

Applications

Image Stitching is used in the generation on panoramas, medical imagery ,satellite and aerial imagery, in gaming(creating VR enviroments) as well as in Computer Vision and Augmented Reality.

Usage of OOP

Our project has employed numerous concepts taught in OOP such as Classes, Structures, Abstraction, Polymorphism, Inheritance along with file handling and header files making the code neat and modular.

Implemetation

Language used

Software

Visual Studio Code

Visual Studio

CMake

WHAT IS CMAKE ?

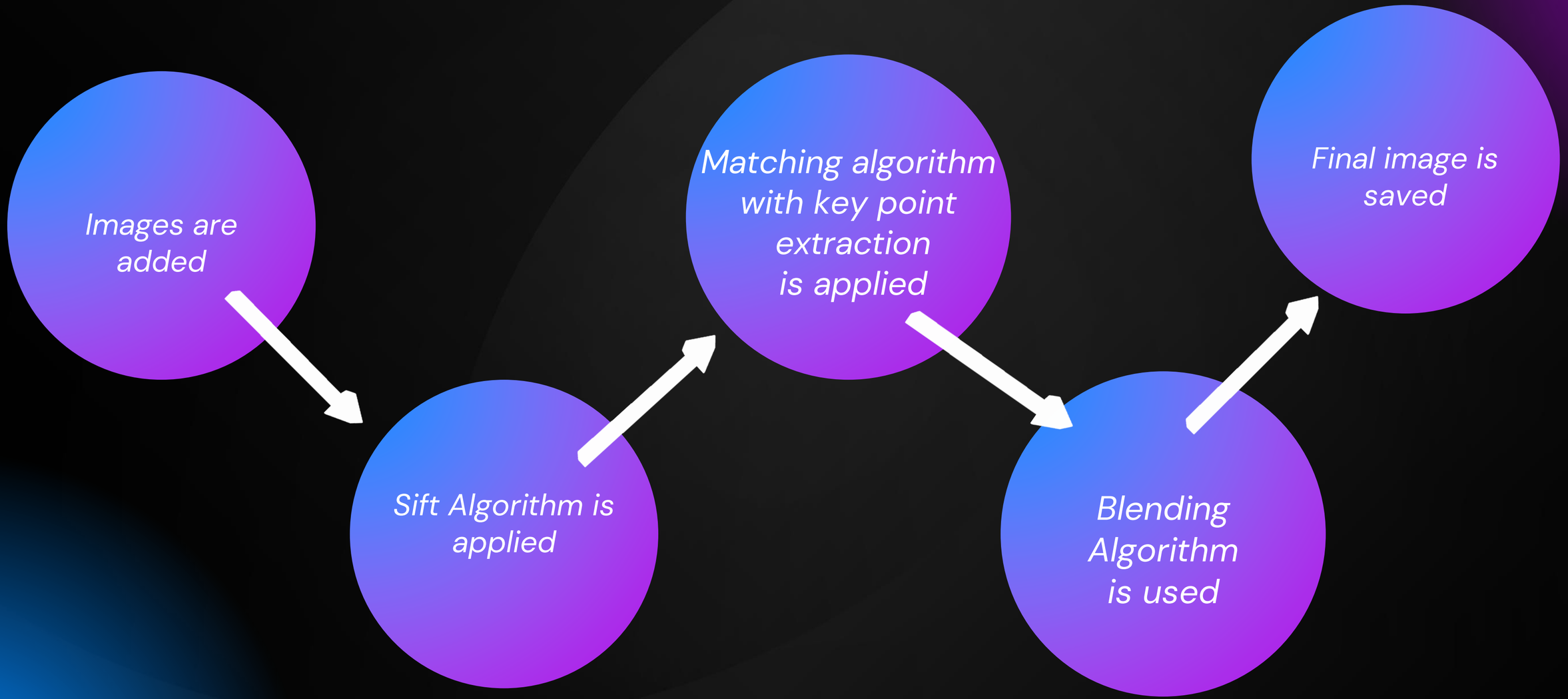
Cross-Platform Software build

Advantages

- Makes the Code Modular
- Allows for local builds
- Allows code to run on different IDEs
- Independent of OS

CMake, which stands for Cross-Platform Make, is an open-source build system that manages the build process in software development projects. It is designed to be platform-independent and works across different operating systems, making it easier to write build scripts that can be used on various platforms without modification.

Project Flowchart



Libraries used

OpenCV is a library of programming functions mainly for real-time computer vision.

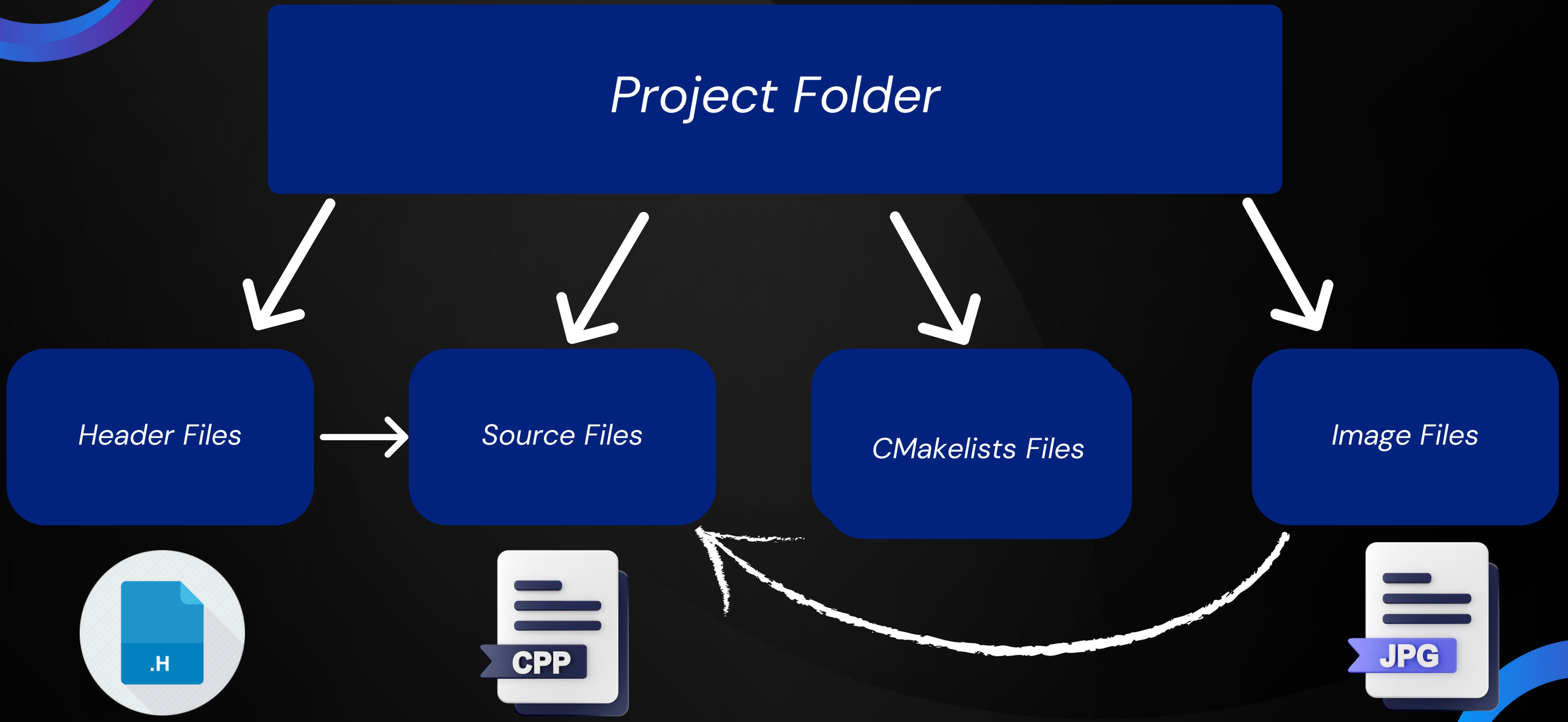
The CImg Library

The CImg Library is an image processing library, designed for C++ programmers. It provides useful classes and functions to load/save, display and process various types of images.

Many other built in C++ libraries

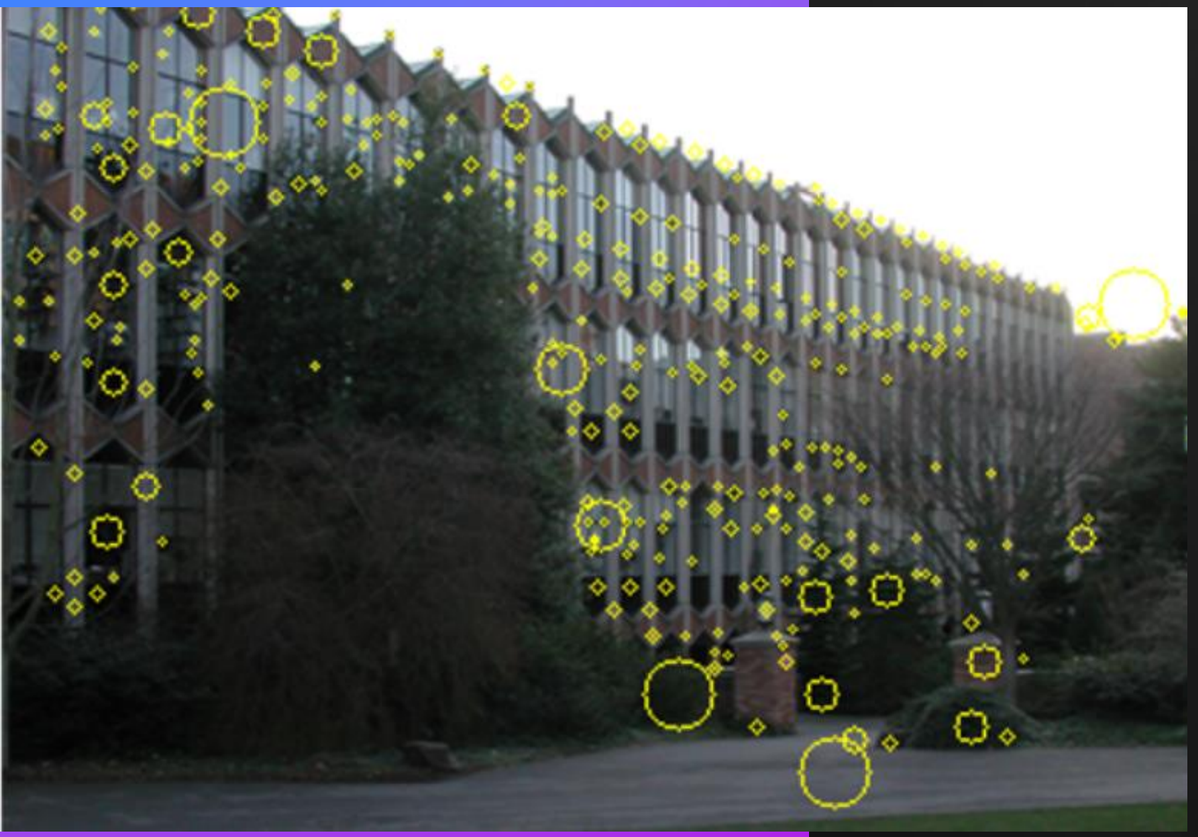
From the standard library to various others all used in order to make use of their included functions.

Project Folder Tree



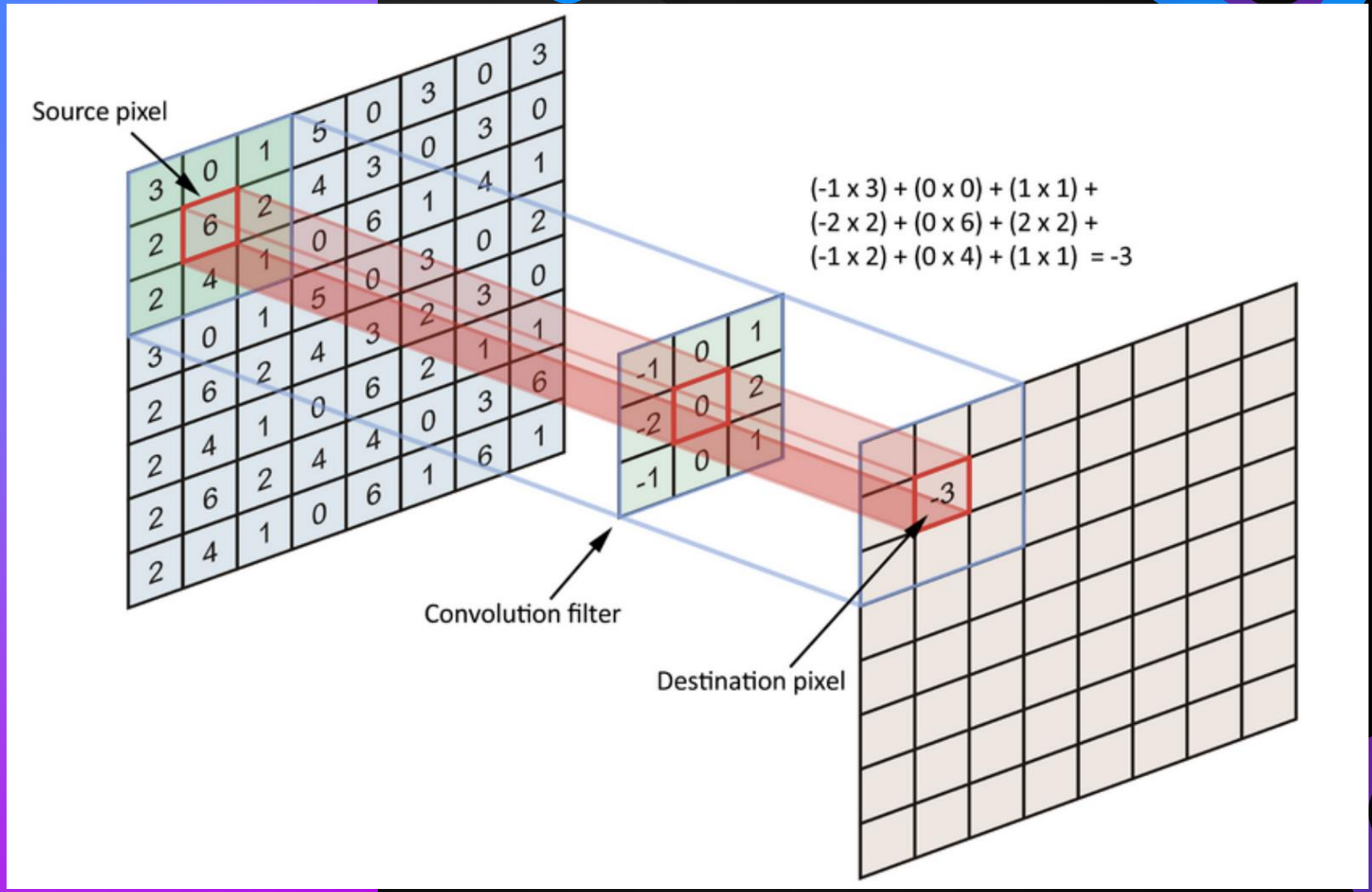
Algoritms

SIFT

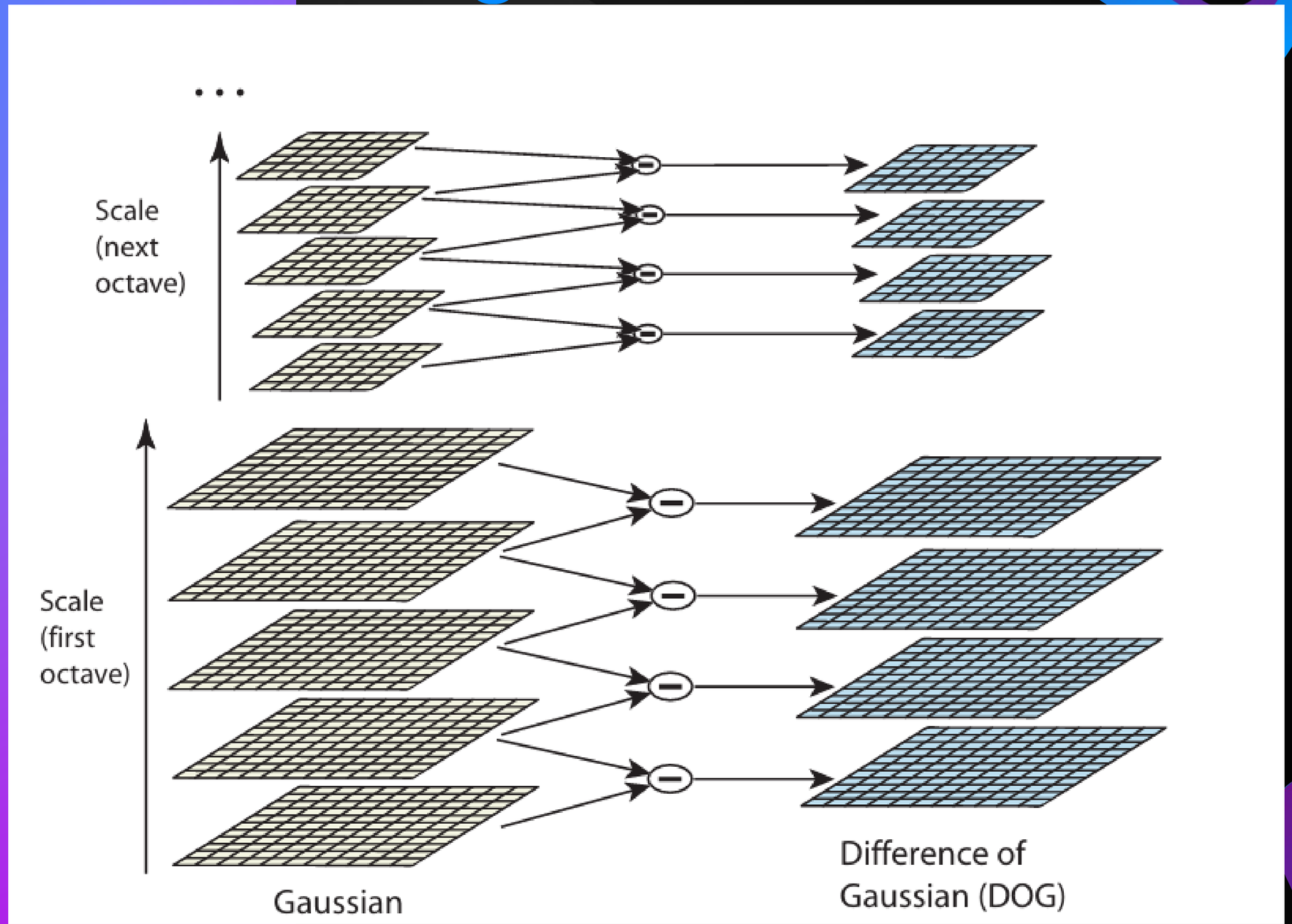


The SIFT (Scale-Invariant Feature Transform) algorithm in image stitching programs detects and matches distinctive features across multiple images. It identifies key points, assigns orientations, generates descriptors, and uses these to find corresponding points in different images. SIFT contributes to accurate alignment and seamless blending, essential for creating panoramic views.

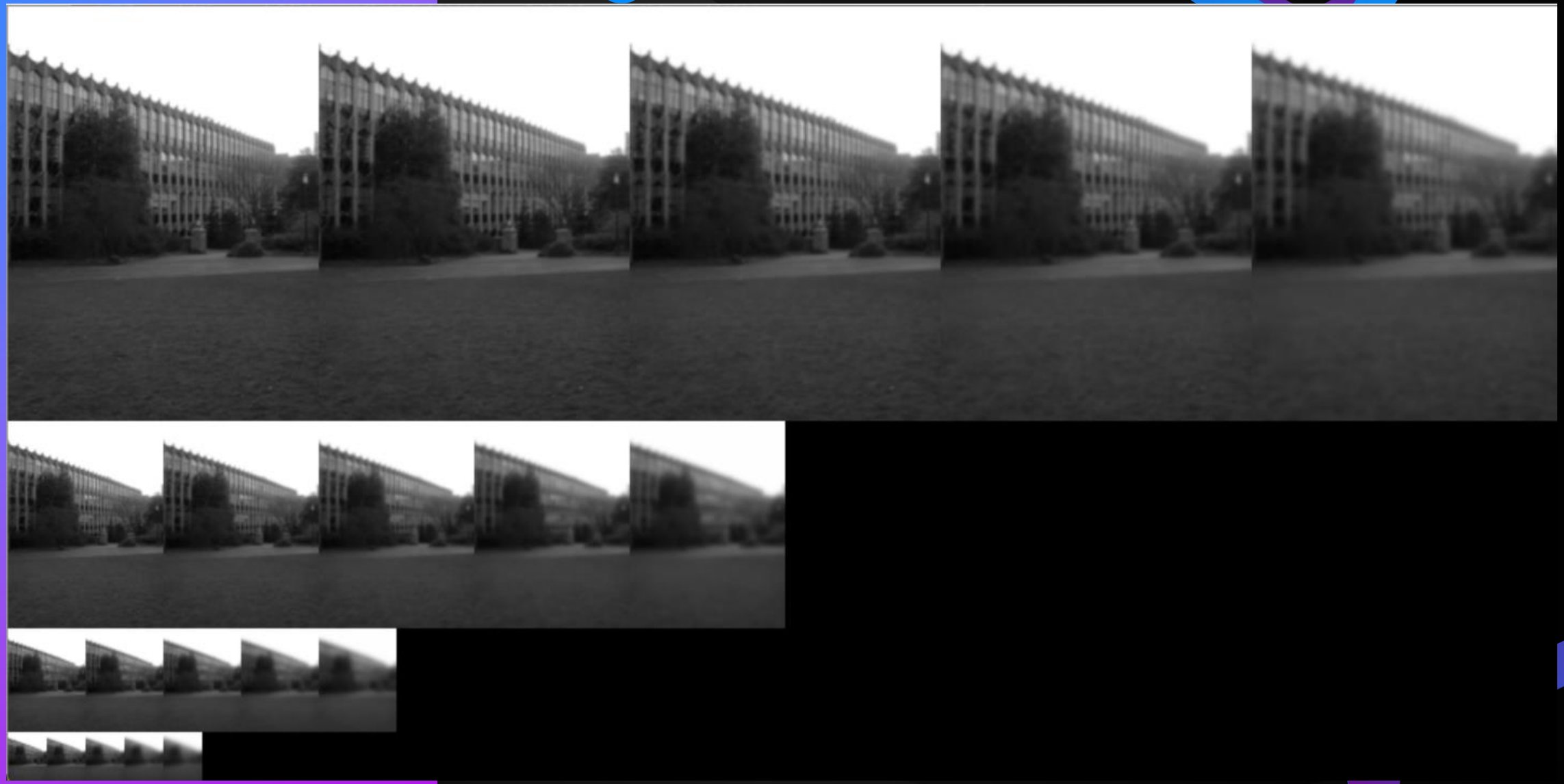
Algoritms SIFT

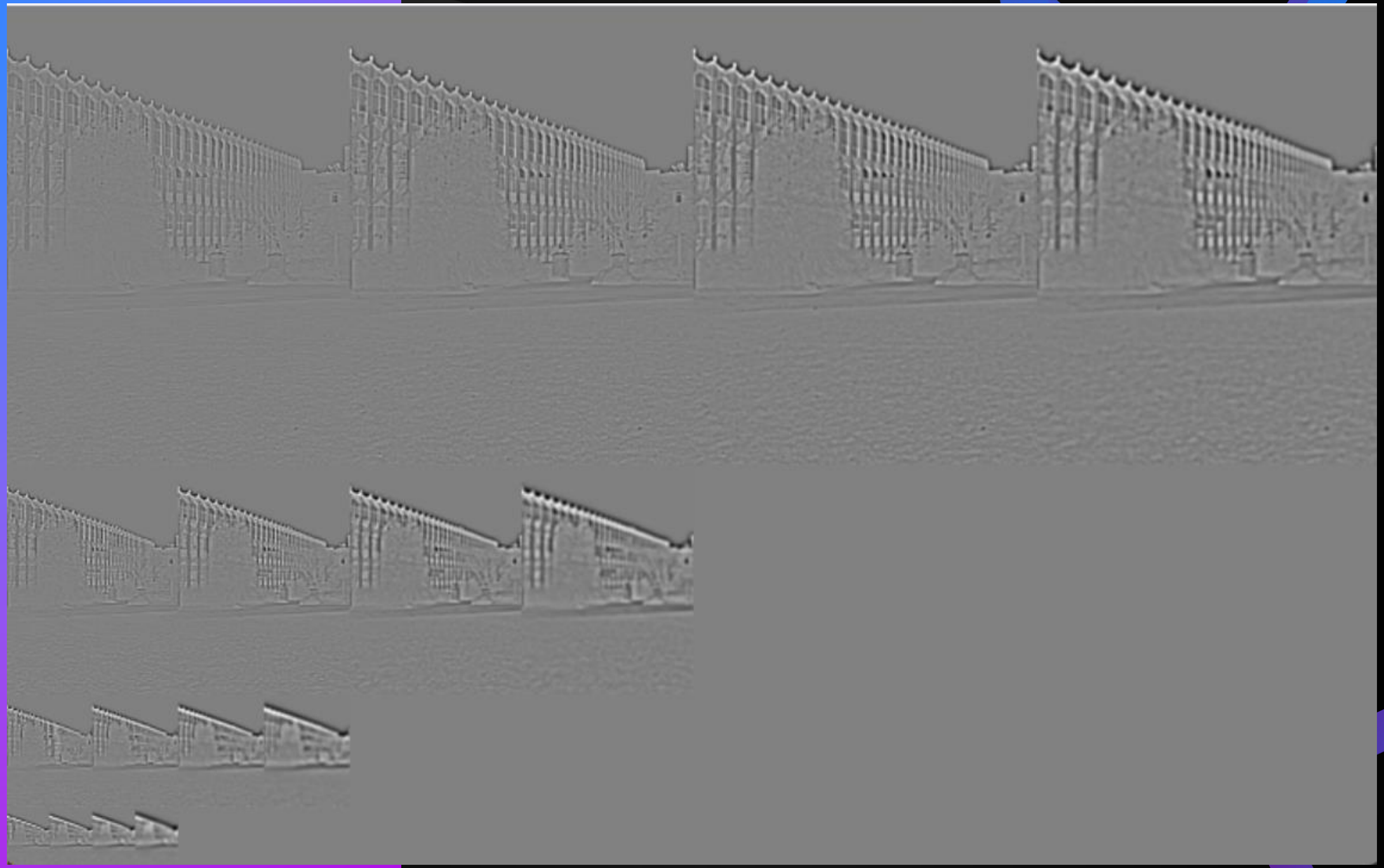


Algoritms SIFT



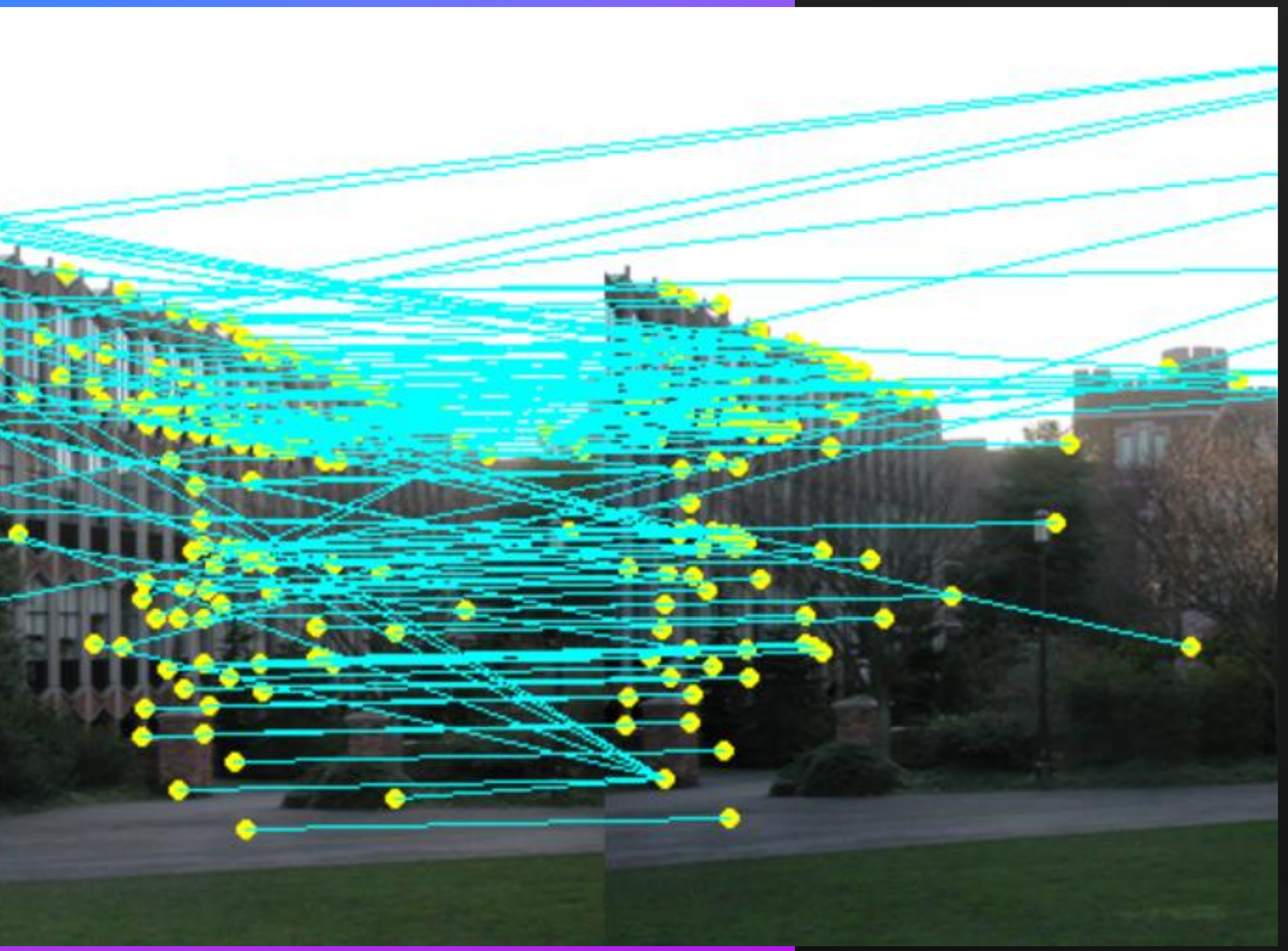
Algoritms SIFT





Algoritms

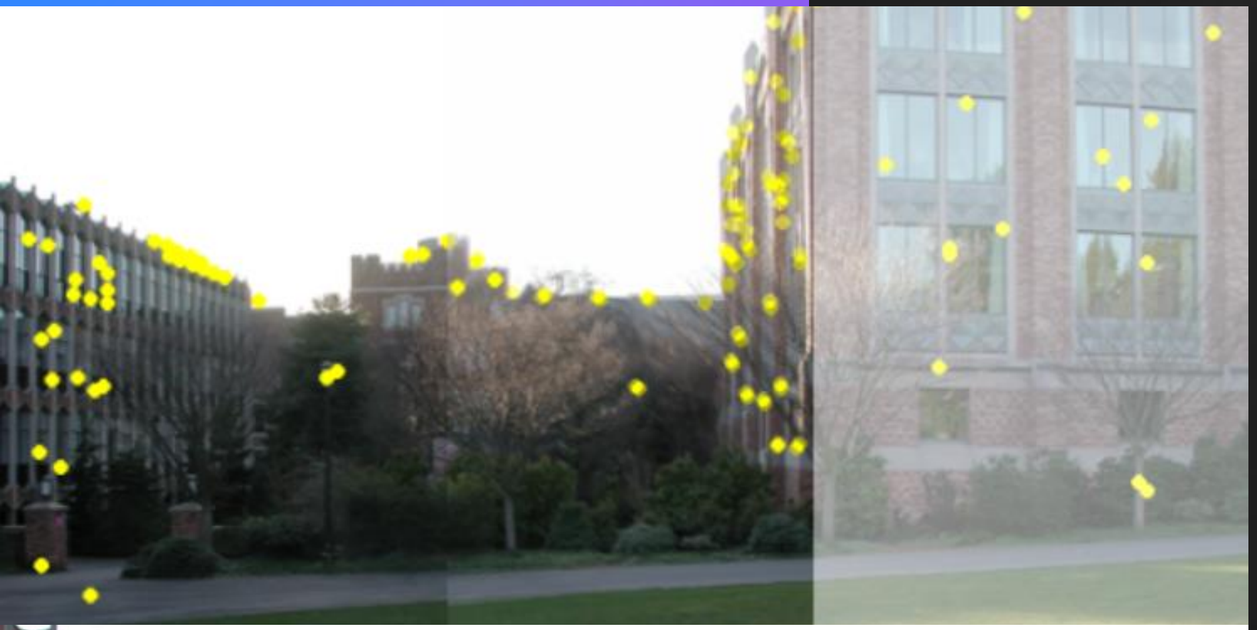
Matching

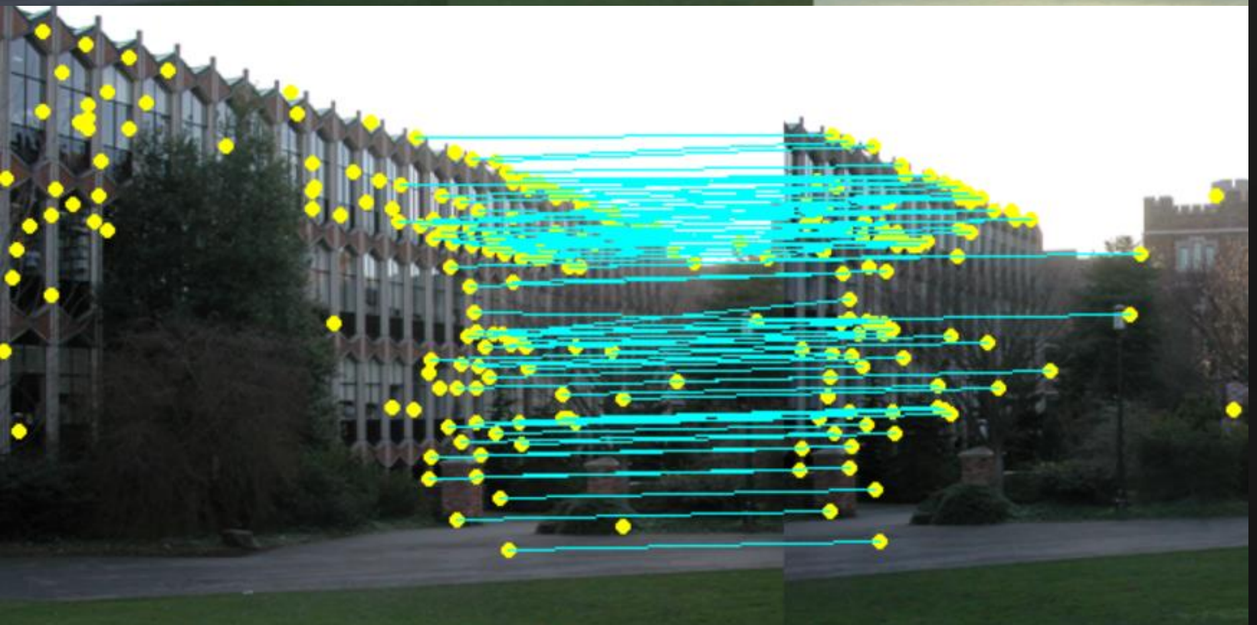


The matching algorithm in image stitching programs, often utilizing techniques like SIFT, identifies corresponding points in different images by comparing their distinctive feature descriptors. This process enables accurate alignment and seamless blending of images for creating panoramic views.

Algoritms

Blending



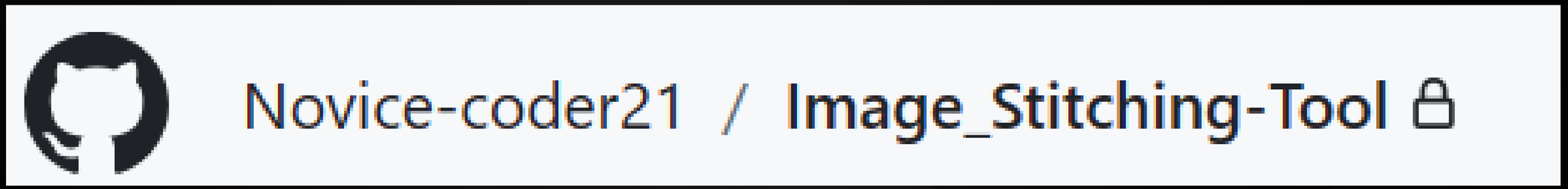


The blending algorithm in image stitching programs combines overlapping regions of aligned images seamlessly, ensuring a smooth transition between them and creating a cohesive panoramic view. This process aims to eliminate visible seams and enhance the overall visual continuity of the stitched images.

Demonstration

GitHub

Github repository:
https://github.com/Novice-coder21/Image_Stitching-Tool



References

D. G. Lowe, "Distinctive Image Features from Scale-Invariant Keypoints," Computer Science Department, University of British Columbia, Vancouver, B.C., Canada, Email: lowe@cs.ubc.ca.

https://www.youtube.com/watch?v=m9HBM1m_EMU&pp=ygUtYWRkaW5nIGNtYWtlIGFuZCBvcGVuY3YgdG8gdmlzdWFsIHN0dWRpbyBjb2Rl
Adding OpenCV and CMake to the compiler.

https://www.youtube.com/watch?v=J1DwQzab6Jg&list=PL2zRqk16wsdp8KbDfHKvPYNGF2L-zQASc
The explanation and understanding of the algorithms of Image Stitching

https://pyimagesearch.com/2018/12/17/image-stitching-with-opencv-and-python/
Used for understading the implementations.

THANK YOU

Any Questions?

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https://github.com/Novice-coder21/Image_Stitching-Tool

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