FAU FLORIDA ATLANTIC UNIVERSITY

CI-PIRE

UNIVERSITÀ DEGLI STUDI DI MILANO

LA Grid Latin American Grid

NSF National Science Foundation

**Partnership for International Research and Education
A Global Living Laboratory for Cyberinfrastructure Application Enablement**

**Project Title: Flower Recognition System on iPhone
Student:** Aleksandar Colic, PhD student, FAU
Research Advisors: Hari Kalva, PhD, FAU and Borko Furht, PhD, FAU
CI-PIRE Partner Advisor: Ernesto Damiani, PhD, Universita Degli Studi di Milano

I. Research Overview and Outcome

Motivation

How many times You have seen a flower but did not know what is its name? Or a car? Or any other object?

Mobile devices with built-in cameras allow a number of interesting and useful applications.

Object Detection/Recognition

Compute intensive problem.

Problem existing for many years.
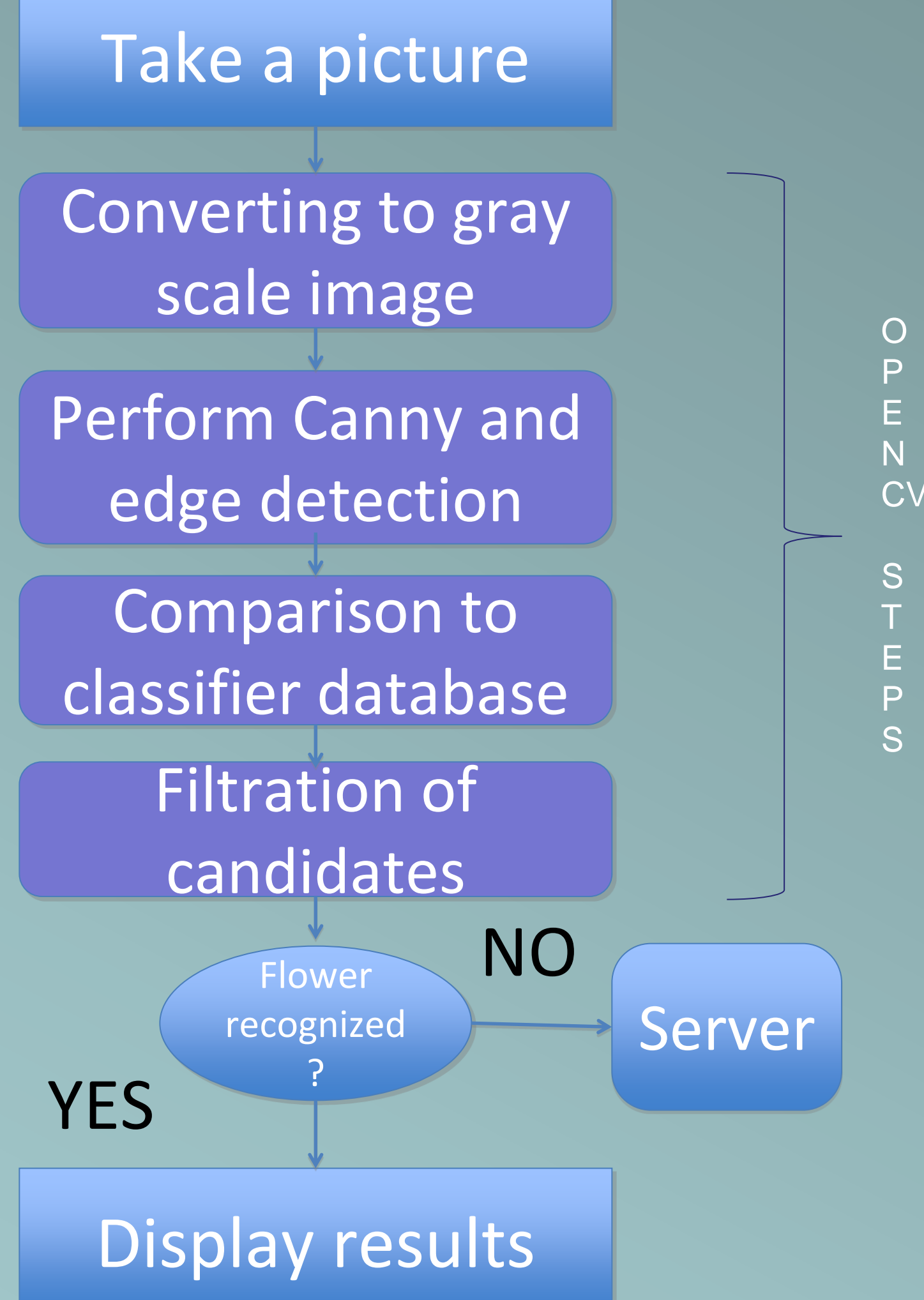
Not much of a progress made.

Way to go - Studying human brain.

iPhone

Simple to use and widely spread.

Easy to develop applications for it.

Already available image processing library for it – OpenCV.

Take a picture

OPENCV STEPS
- Converting to gray scale image
- Perform Canny and edge detection
- Comparison to classifier database
- Filtration of candidates

Flower recognized? — NO → **Server**

YES

Display results

Many Shapes
Many Classes
Many Varieties

Goals

➤ Study the problem of object recognition with the emphasis on flowers.
➤ Design an algorithm for flowers recognition .
➤ Conduct experiments with a flower database.
➤ Implement interactive user interface and the algorithm as an iPhone application.

Conclusions

➤Flower recognition is highly difficult task.
➤iPhone's software and hardware limitations are forcing applications development to lean toward server implementation.
➤Best that can be done is flower classification or recognition of specific class of flowers.

Future work

➤ Finding more suitable library then OpenCV
➤ Focus on classification or specific class recognition
➤ Potentially develop similar app for detection of poisonous mushrooms

II. International Experience

Milano

Venice

Career Impact

This experience certainly provided me with a necessary push toward completing my PhD studies. It provided me with additional knowledge in the areas of image and video processing which is needed for successfully attacking some of the obstacles I will encounter later on in my studies.

Milano

At first glance, Milan (Milano) can appear like one of the models gracing its catwalks: great bone structure (in the shape of historic and striking new architecture), extravagant taste and no obvious soul. But Milan's style and, yes, substance, are more than skin deep.
Milan is the engine room of the country's economy and home of its stock exchange, yet it isn't driven by tourism. Treasures that survived WWII's extensive damage include its elaborate cathedral, Leonardo da Vinci's The Last Supper, La Scala .

Universita Degli Studi di Milano

The University of Milan is a public, multidisciplinary teaching and research institution. With more then 2,500 professors, they represent the highest concentration of scientific expertise in the region and their research is ranked among the best in Italy and Europe. The University's departments are housed in important historic edifices in the center of Milan and in modern buildings in the area known as Città Studi (the City of Studies).

Travel

Italy is certainly not lacking places to visit and see. Every town holds something new and exciting. Every place shows little bit different interpretation of a long and rich history through architecture, language, cooking, art. Places to see are endless and I have to warn enthusiasts that exploring everything will take a loooong time.☺ Start with Rome, Milano and Venice!

Great Experience

III. Acknowledgement