

2019 UNCG CSC 490

# BATALOG

SENIOR CAPSTONE PRESENTATION



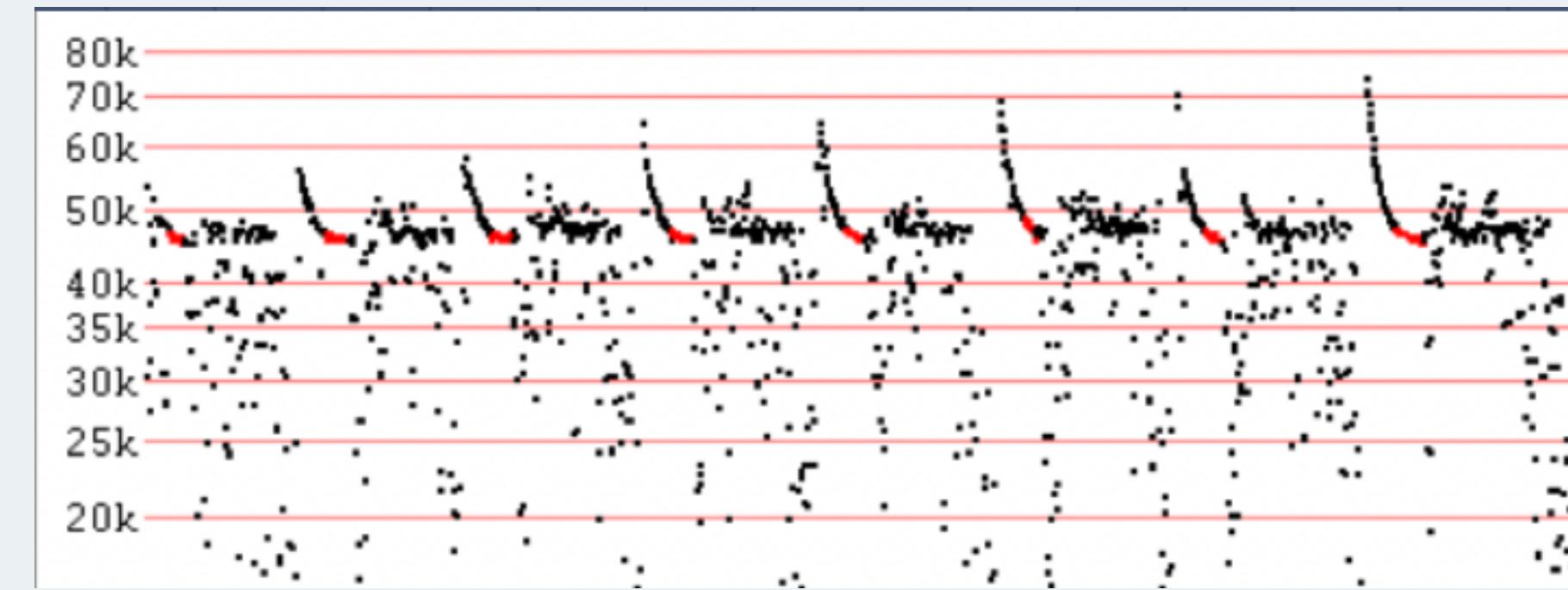
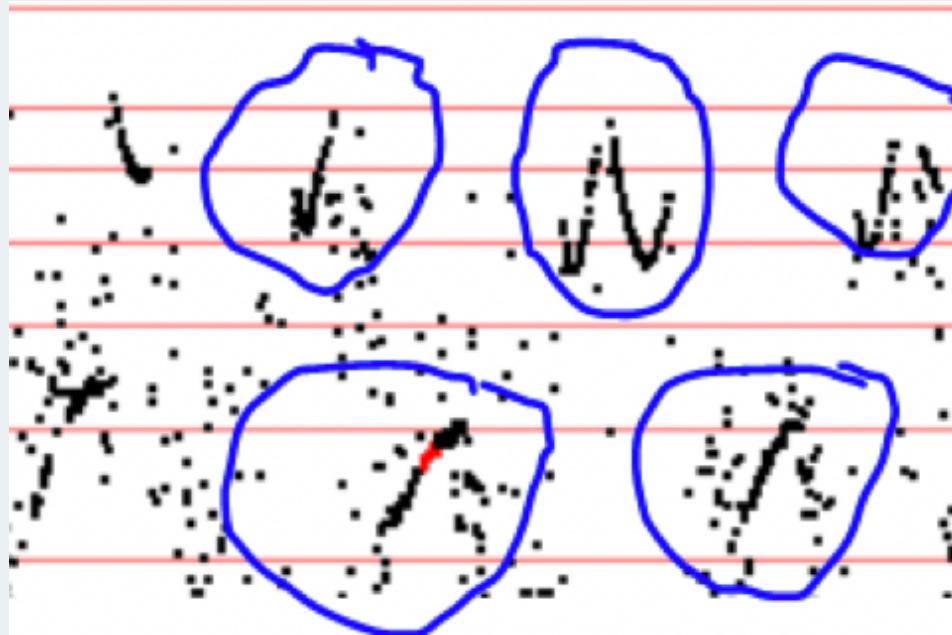
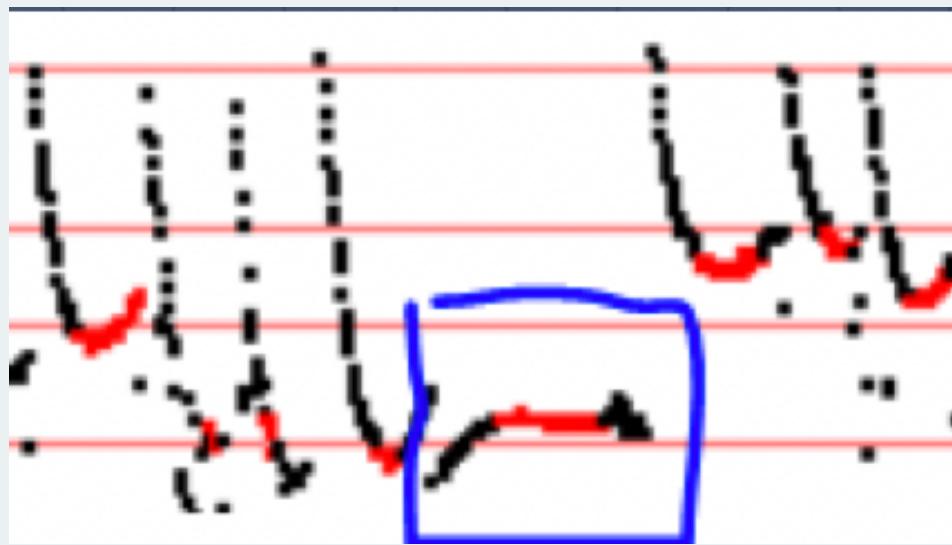
## Introduction

# WHAT IS BATALOG?

AN INTEGRATED SOLUTION SUITE FOR BAT RESEARCHERS

# THE DATA

A collection of bat calls



- Bats calls are recorded and converted to zero-crossing form
- For our purposes, all calls are either normal or abnormal
- In a given night, researchers can record thousands of calls



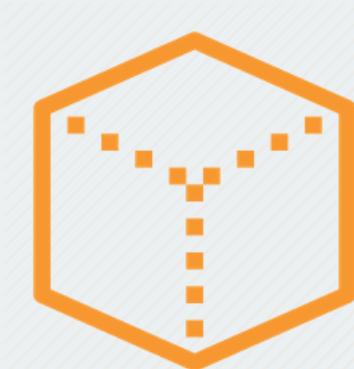
# WHY WE MATTER?

# WORK FLOW

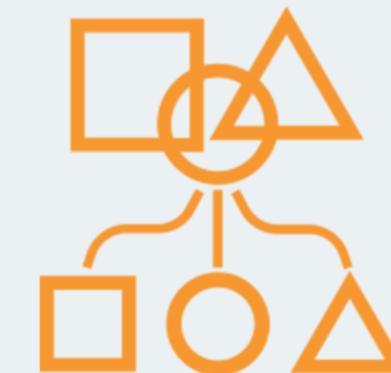
The data analysis and display process



Extraction



Rendering



Classification

# SUBSYSTEMS

## System - Design Perspective



**HADI SOUFI**

- Zero Crossing File Analysis
- Bring the website Online
- Download as Zip

**DAVID MASSEY**

- CNN

**THIEN LE**

- Front End
- Display Images

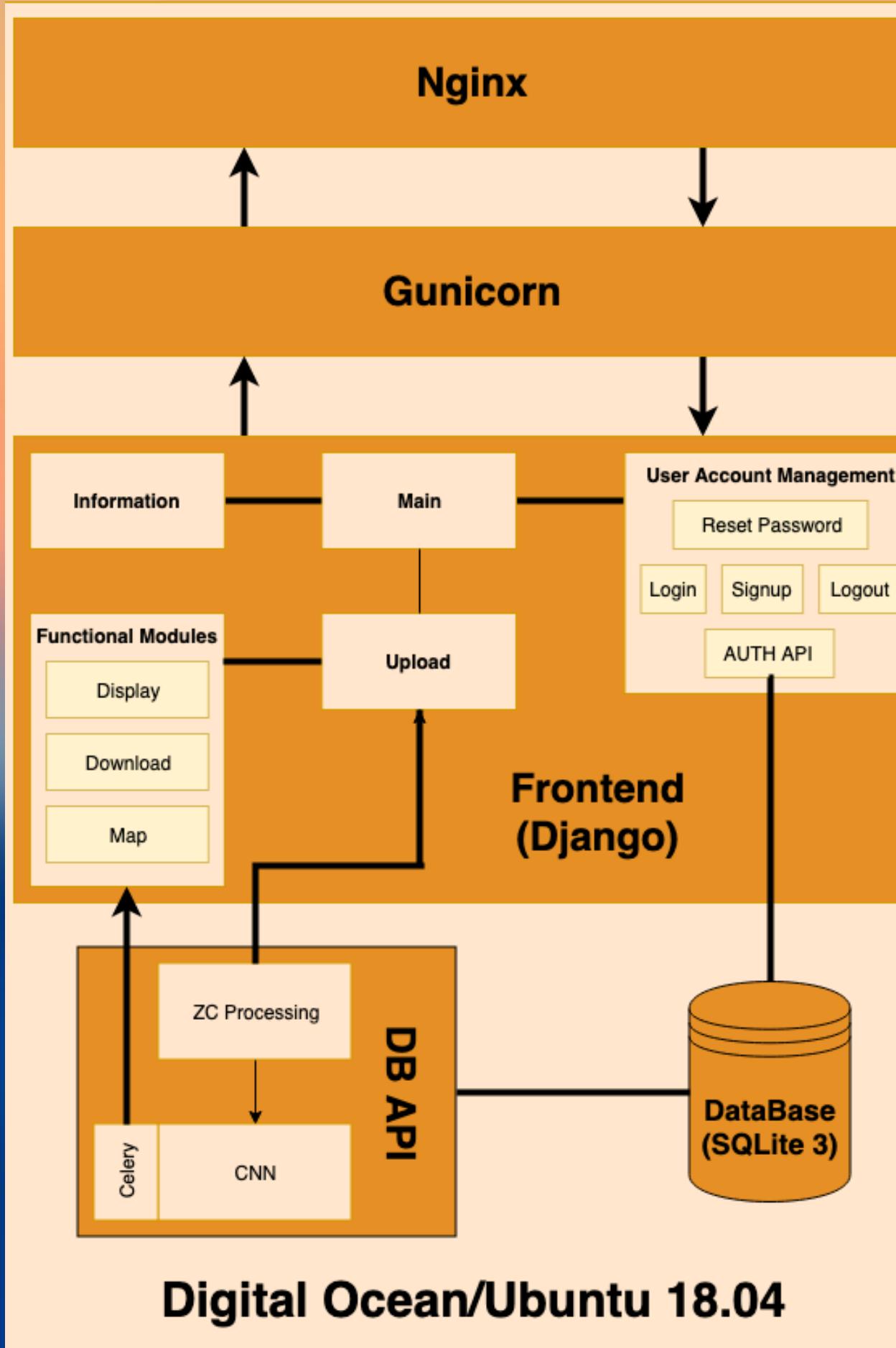
**KEVIN KEOMALAYTHONG**

- Database API

**RAHIM IQBAL**

- User Account Management
- Generate Map

# SYSTEM DESIGN



## TECHNOLOGIES

- Digital Ocean (Nginx, Gunicorn, Celery): Web hosting services
- Django (HTML5): Web development framework
- SQLite3: Python-SQL link for creating database connectivity
- Python: Primary coding language
- Keras with Tensorflow

## PURPOSE

Strips noise and extracts pulses from ZC files

## METHODS

Pulse distance

Pulse size

Change in slope

Smoothing function (Savitzky Golay)

## TECHNOLOGIES NOISE REMOVAL

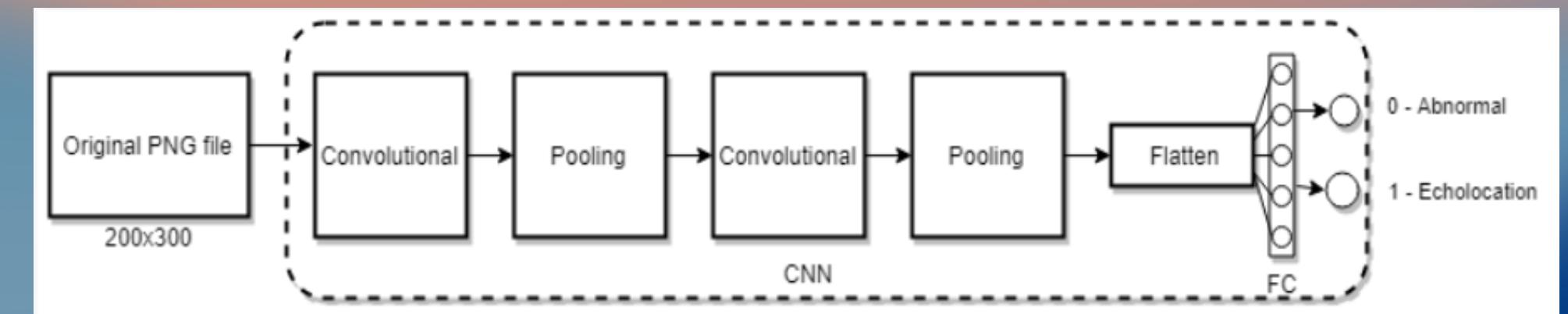
## PURPOSE

- Classify images as echolocation or abnormal calls
- CNN Receives images as PNG images that are of size 200x300
- Images are processed through six hidden layers
- The output is a value that represents the prediction
- 0 = Abnormal call
- 1 = Echolocation call.

## HIGHEST ACCURACY

91% for abnormal files & 99% for echolocation files

## TECHNOLOGIES - CNN



# CONCLUSION

## Contributions to Users:

- Analyze and store the labeled data through our tool

## Contribution to Industry:

- Novel algorithms for bat call analysis
- First to provide a user friendly environment
- Open source project





# BATALOG LIVE DEMO

**An Integrated Solution Suite for Bat Scientists**

## GROUP MEMBERS

Hadi Soufi, Thien Le, Kevin Keomalaythong, David Massey,  
Rahim Iqbal

## ADVISORS

Dr. Somya Mohanty and Dr. Han Li

## EMAIL

[batalogsup@gmail.com](mailto:batalogsup@gmail.com)