

Phantastic Fungi

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Preface

This is a proposal for the Phantastic Fungi project for partial fulfillment of the requirements of a Software Engineering course (CSC431) project in the department of Computer Science at the University of Miami.

This proposal provides the scope and context of the project to be undertaken. It details the intended user group and the value that the system will have to them.

The intended audience of this document is the course professor and teaching assistants so that they can determine whether the project should be approved as proposed, approved with modifications, or not approved.

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1 Overview

1.1 Purpose, Scope, and Objectives

The Phantastic Fungi project seeks to develop a machine learning application that can identify the genus and species of a mushroom from an image. Such an application would be targeted to anyone who wants to identify a mushroom or other fungus, and could be used either in the wild or in a controlled environment, such as a lab. It shall be accessible as a web application from either a mobile device or personal computer. The software required would be two-fold: back-end code to prepare the dataset, train a neural network (including its architecture), and upload it to a web-based application; and front-end code that maintains a web-based user interface that allows users to upload photos and receive a predicted classification.

1.2 Project Description

In the wild, it can be difficult even for the most knowledgeable mycologist to accurately identify mushrooms. The goal of Phantastic Fungi would be to use a large dataset of pre-identified mushrooms to aid in the classification of mushrooms and provide further information for users to verify this classification.

The project provides a single service: classification for an uploaded image of a mushroom. The user will upload an image to the website application which will return a predicted classification of genus and species and a link to the relevant Wikipedia page.

Aspects of the project include:

1. A dataset of mushroom images pulled from mushroomobserver.org, with code for preparing the dataset adapted from:
<https://github.com/bechtle/mushroomobser-dataset>.
2. A neural network pretrained on ImageNet-21k as provided by Google research at github.com/google-research/big_transfer and introduced in their paper “Big Transfer (BiT): General Visual Representation Learning”. Our group will fine-tune the network on our custom dataset.
3. A web architecture and accompanying mobile app to host the inference network and a user interface that accepts image uploads and returns the network’s prediction for the genus and species along with other relevant information.