

Apple Disease Identifier

Bridging Data Science and Agriculture

Introduction

Hi, I'm Brian, a master's student in Data Science at Eastern University, wrapping up my studies. For my capstone project, I ventured into a field that merges my academic pursuits with a personal interest: agriculture. The outcome of this venture is the "Apple Disease Identifier."



Why Apple Disease Identifier?

- Background
- Role
- Focus
- The Challenge
- Impact on Farmers
- Sustainable Practices
- Driving Force



Choosing PyTorch

Why PyTorch?

- Ease of Use
- Dynamic Computation Graph
- Community Support
- Flexibility
- Performance and Scalability
- Project Impact



Why EfficientNet?

- Model Choice
 - State-of-the-Art Efficiency
 - Compound Scaling
 - Versatility and Adaptability
- Advantages
 - High Accuracy with Lower Computational Cost
 - Transfer Learning
- Impact on Project



Challenges Faced

- Navigating Flask
 - Initial Hurdles
 - Debug Mode Dilemmas
- Technical Trials
 - Aging Equipment
 - Anaconda Anomalies
- Model Training Time Optimization
 - Runtime Issues
 - Data Reduction Strategy
- Software Updates for Debugging
 - Spyder and Watchdog upgrades



Overcoming Obstacles

Resources Used

- Digital Learning
- Online Communities
- Workplace Insights

Learning Process

- Embracing Self-learning
- Growth Mindset
- Collaboration



The Joy of the Project

Fun Aspects

- Problem-Solving
- Creative Freedom
- Tech Exploration
- Impact Potential

Personal Growth

- Skill Enhancement
- Confidence Boost
- Passion Affirmation
- Professional Readiness



Conclusion

Key Takeaways

- Technical Proficiency
- Problem-Solving Insight
- Collaborative Learning
- Impact and Satisfaction

Future Direction

- Apical Implementation
- Broadening the Scope
- Comprehensive Diagnostic Tool Development
- Community and Industry Collaboration



Thank you

A Heartfelt Thanks:

Thank you for your time and attention. It's been a pleasure to share the "Apple Disease Identifier" project with you, showcasing how data science can innovatively contribute to agriculture.

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References

abhisuri97. (2019, August 19). How to use Python and Flask to build a web app - an in-depth tutorial. freeCodeCamp.org.

<https://www.freecodecamp.org/news/how-to-use-python-and-flask-to-build-a-web-app-an-in-depth-tutorial-437dbfe9f1c6/>

Bhattarai, S. (2018, November 18). New Plant Diseases Dataset. Kaggle. <https://www.kaggle.com/datasets/vip00000l/new-plant-diseases-dataset>

Build software better, together. GitHub. (n.d.). <https://github.com/topics/plant-disease-detection>

Dyouri, A. (2021, September 13). How to use templates in a flask application. DigitalOcean. <https://www.digitalocean.com/community/tutorials/how-to-use-templates-in-a-flask-application>

Flask. Full Stack Python. (n.d.). <https://www.fullstackpython.com/flask.html>

freeCodeCamp.org. (2020, August 12). Learn flask web development for python in this free 1-hour course. <https://www.freecodecamp.org/news/learn-flask-for-python-full-tutorial/>

freeCodeCamp.org. (2021, April 28). How to install flask in a virtual environment. <https://www.freecodecamp.org/news/how-to-install-flask-in-a-virtual-environment/>

GfG. (2023, February 5). Placeholders in Jinja2 template - python. GeeksforGeeks. <https://www.geeksforgeeks.org/placeholders-in-jinja2-template-python/>

Matplotlib.pyplot.imshow#. matplotlib.pyplot.imshow - Matplotlib 3.8.3 documentation. (n.d.-a). https://matplotlib.org/stable/api/_as_gen/matplotlib.pyplot.imshow.html

Matplotlib.pyplot.imshow#. matplotlib.pyplot.imshow - Matplotlib 3.8.3 documentation. (n.d.-b). https://matplotlib.org/stable/api/_as_gen/matplotlib.pyplot.imshow.html

ML+Cheat+sheet_2.PDF. (n.d.). https://s3.amazonaws.com/assets.datacamp.com/email/other/ML+Cheat+Sheet_2.pdf

Ochieng, O. E. (2021, November 1). *How to authenticate users in flask with flask-login*. freeCodeCamp.org. <https://www.freecodecamp.org/news/how-to-authenticate-users-in-flask/>

Papers with code - plantdoc dataset. Dataset | Papers With Code. (n.d.). <https://paperswithcode.com/dataset/plantdoc>

Real Python. (2022, December 20). Primer on Jinja Templating. <https://realpython.com/primer-on-jinja-templating/>



References

Real Python. (2024, March 22). Build a scalable flask web project from scratch.
<https://realpython.com/python-web-applications-with-flask-part-i/#articles-in-this-series>

S, A. R. N. (2021, May 19). 05B CIFAR10 resnet - notebook by Aakash Rao N S (aakashns). Jovian.
<https://jovian.ai/aakashns/05b-cifar10-resnet>

Shireen, A. (2020, June 25). Creating templates with jinja in python. Medium.
<https://atufashireen.medium.com/creating-templates-with-jinja-in-python-3ff3b87d6740>

Start here with machine learning. MachineLearningMastery.com. (2024, January 30).
<https://machinelearningmastery.com/start-here/>

Visualizing models, data, and training with tensorboard¶. Visualizing Models, Data, and Training with TensorBoard - PyTorch Tutorials 2.2.1+cu121 documentation. (n.d.).
https://pytorch.org/tutorials/intermediate/tensorboard_tutorial.html

Welcome to flask¶. Welcome to Flask - Flask Documentation (2.3.x). (n.d.).
<https://flask.palletsprojects.com/en/2.3.x/>

Welcome to pytorch tutorials¶. Welcome to PyTorch Tutorials - PyTorch Tutorials 2.2.1+cu121 documentation. (n.d.). <https://pytorch.org/tutorials/>

YouTube. (2020, January 13). Python jinja - learn how to extends HTML files in jinja template engine.
YouTube. <https://www.youtube.com/watch?v=7mdBRSBS5vc>

YouTube. (2021a, February 1). Python website full tutorial - FLASK, authentication, Databases & More.
YouTube. <https://www.youtube.com/watch?v=dam0GPOAvVI>

YouTube. (2021b, March 10). Flask Course - python web application development. YouTube.
<https://www.youtube.com/watch?v=Qr4QMBUPxWo>

YouTube. (2021c, March 10). Flask Course - python web application development. YouTube.
<https://www.youtube.com/watch?v=Qr4QMBUPxWo&t=1109s>

YouTube. (n.d.-a). Discover flask - <http://discoverflask.com>. YouTube.
<https://www.youtube.com/playlist?list=PLLjmbh6XPGK4ISY747FUHXEI9IBxre4mM>

YouTube. (n.d.-b). Flask Tutorials. YouTube.
<https://www.youtube.com/playlist?list=PL-osiE80TeTs4UjLw5MM60JgkjFeUxCYH>

