KubeDDR! a Dance of Predictive Scoring with MLOps, Step by Step

Annie Talvasto &
Leigh Capili

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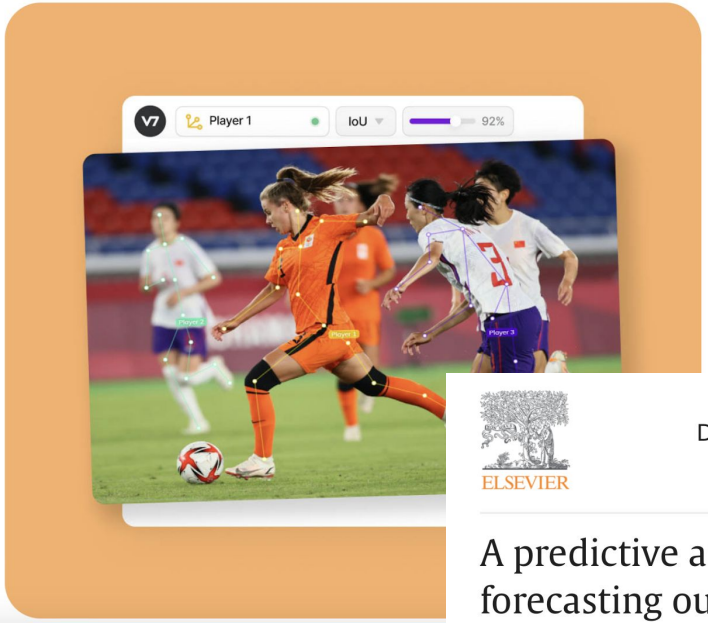
BLOG ARTIFICIAL INTELLIGENCE

7 Game-Changing AI Applications in the Sports Industry

Artificial Intelligence in sports is emerging all over the industry, covering post-game analysis, in-game activity - and even the fan experience. Here are some of the most exciting AI use cases in sports that you should know about. Read on!

8 min read · October 1, 2021

Alberto Rizzoli
V7



Predicting e-sports winners with machine learning

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Bowen Yang · Follow
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oes in Overwatch

from UC Riverside. At Insight, he worked on

An Automated Framework for Predicting Sports Results

How I built an automated machine learning framework to predict the results of rugby matches and tweet the outputs without any oversight

Chris Brownlie · Follow
Published in Towards Data Science · 7 min read · Oct 3, 2019

ELSEVIER

Decision Analytics Journal
Volume 8, September 2023, 100296

A predictive analytics model for forecasting outcomes in the National Football League games using decision tree and logistic regression

Matt Gifford [a], Tuncay Bayrak [b]

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Highlights

- Sports analytics has gained rapid popularity in recent years.

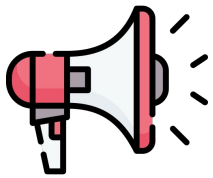
@AnnieTalvasto @capileigh

Sports are a big business and AI is coming for it as well

DanceDance Revolution

ロケテスト開催

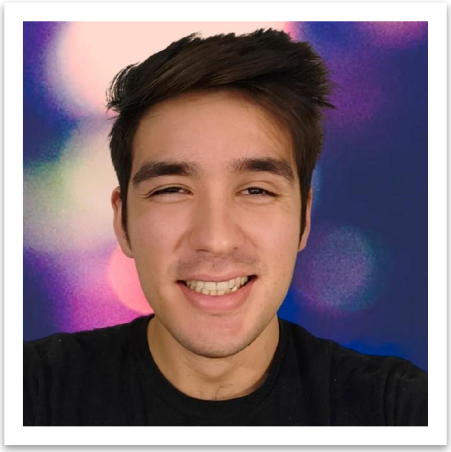
@AnnieTalvasto @capileigh



Annie Talvasto

- CMO at VSHN
- CNCF Ambassador & Azure MVP

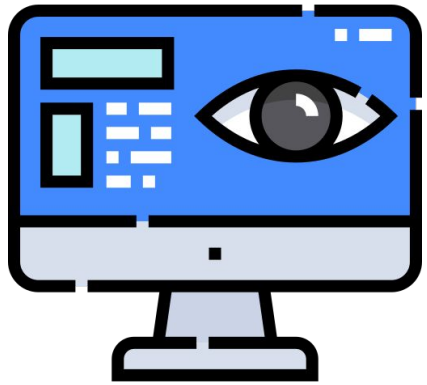
- Kubernetes & CNCF Meetup organizer since 2017, a Cloud Native Live host since 2021.
- Creator of TechCraft Show: youtube.com/@TechCraftShow



Leigh Capili

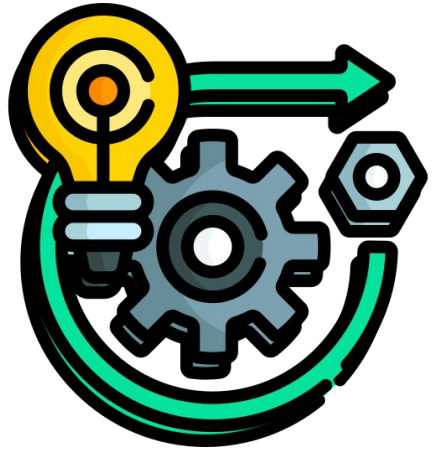
- Staff Developer Advocate, VMWare by Broadcom
- Kubernetes Contributor

DDR + MLOps + Kubernetes = ❤️



Computer Vision

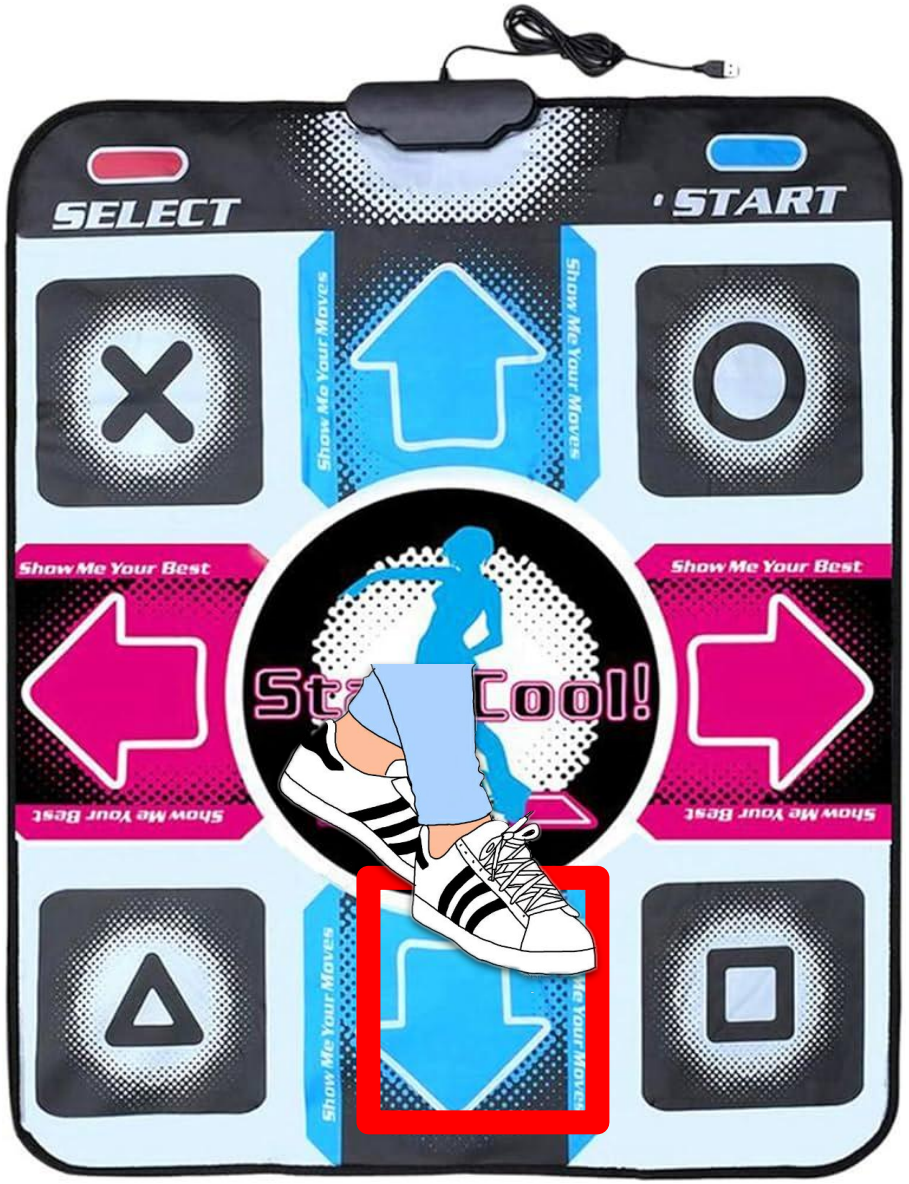
Predictive scoring



MLOps

Computer Vision

- Simple version: Real-Time Object Recognition using OpenCV and YOLO on DDR Dance Pad

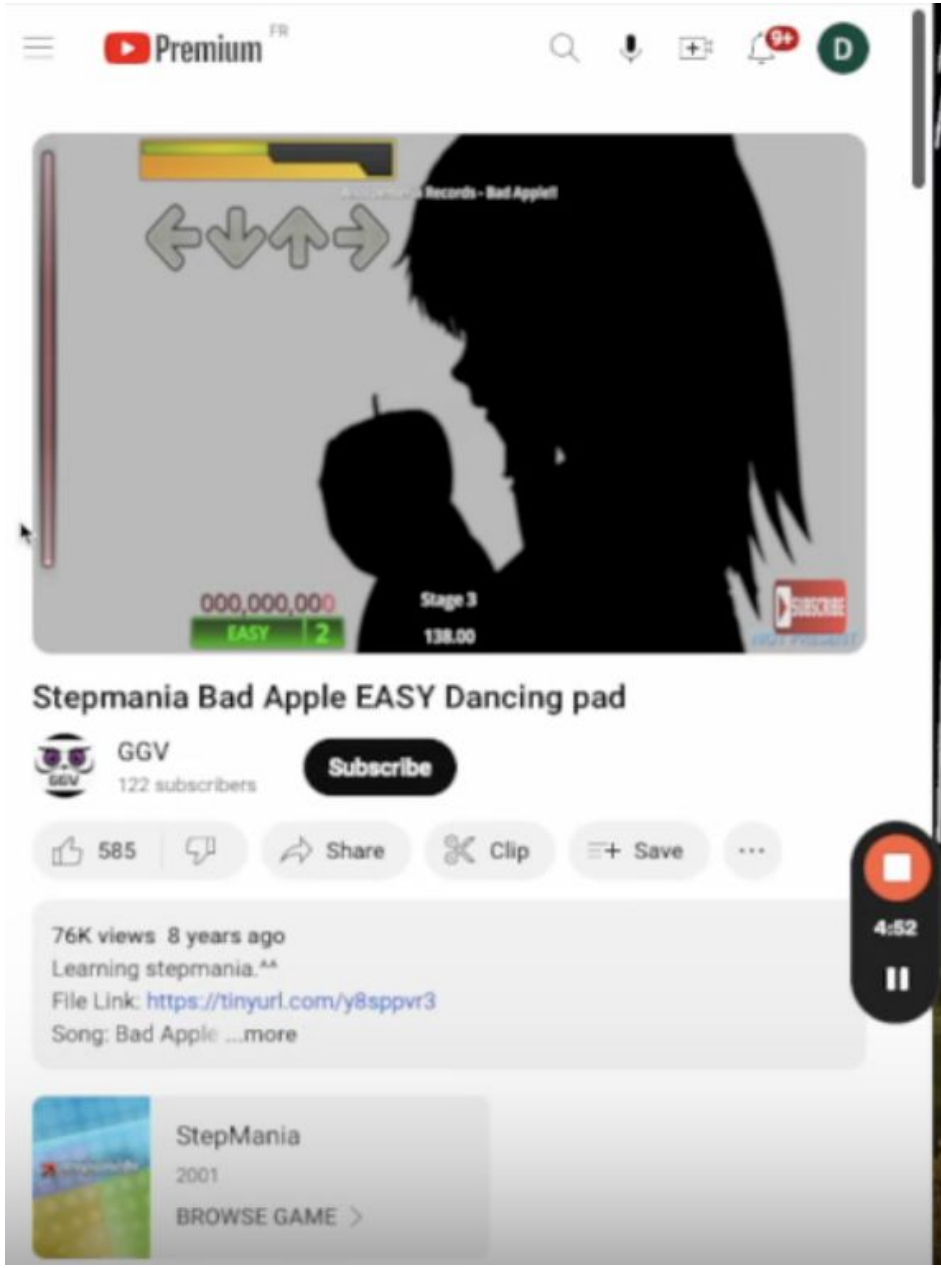


Predictive Scoring

- Optical Character Recognition (OCR) & Algorithms

Demo

- Using OCR with OpenCV, Pytesseract & Numpy to determine winning DDR player realtime.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Stepmania Bad Apple EASY Dancing pad
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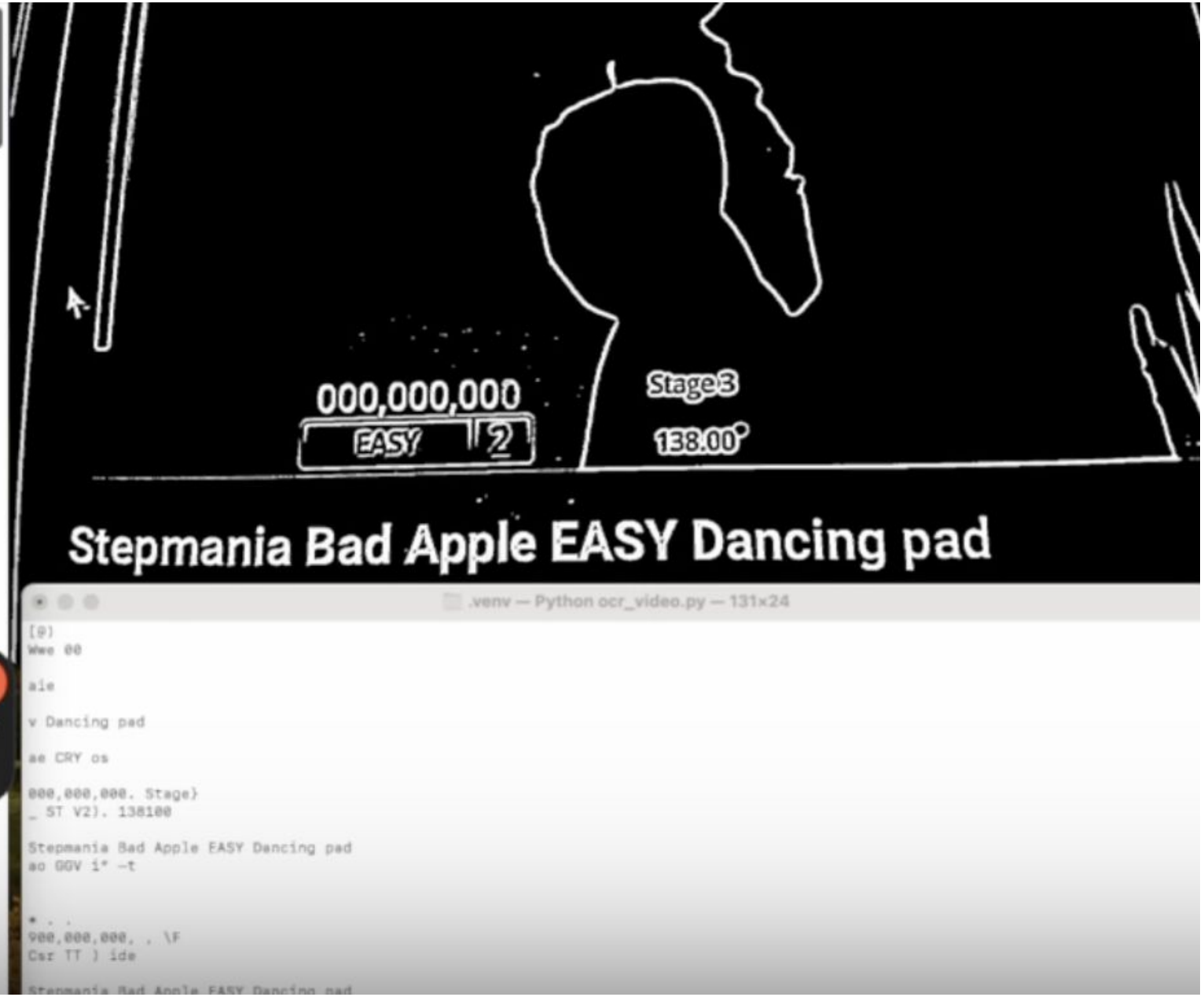
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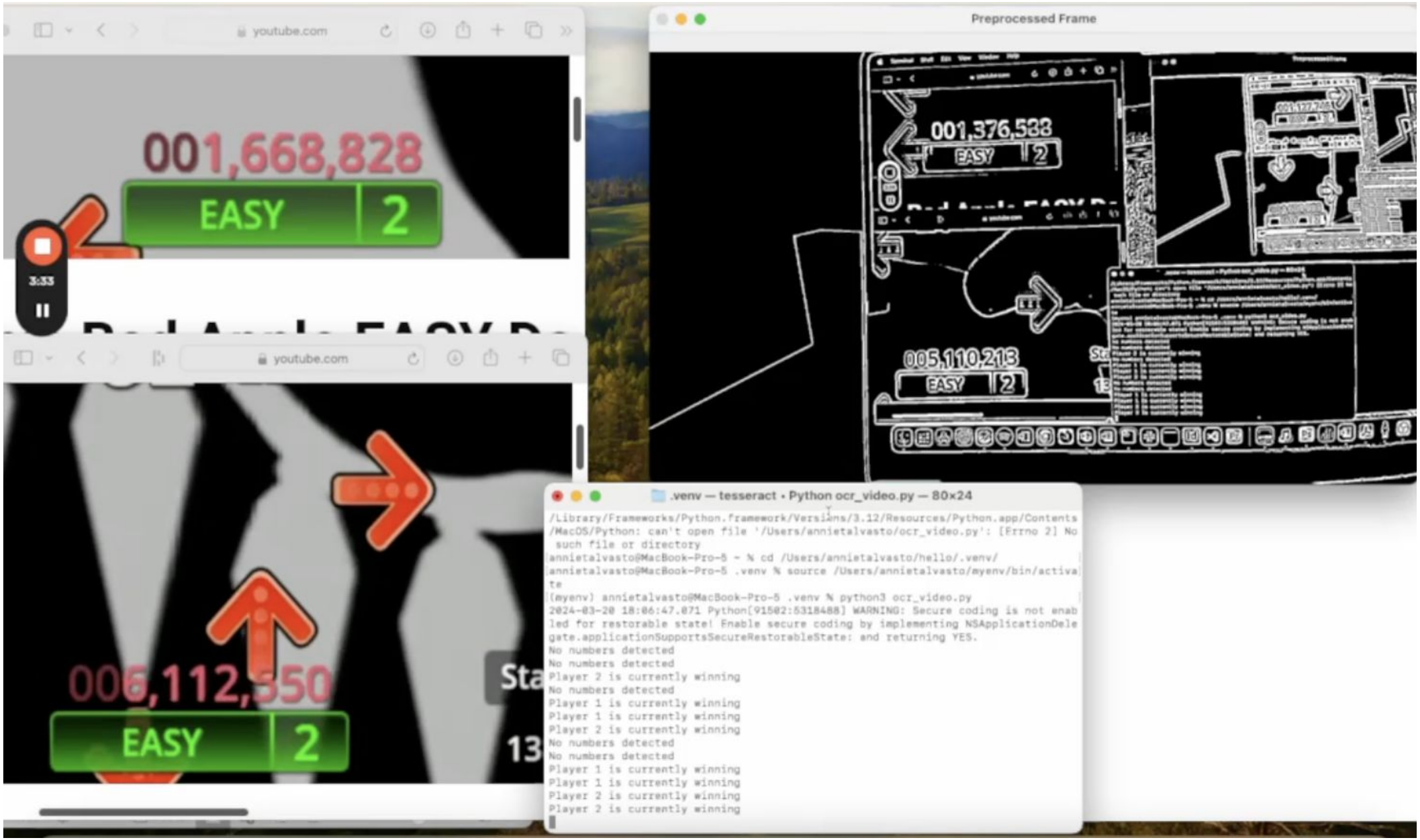
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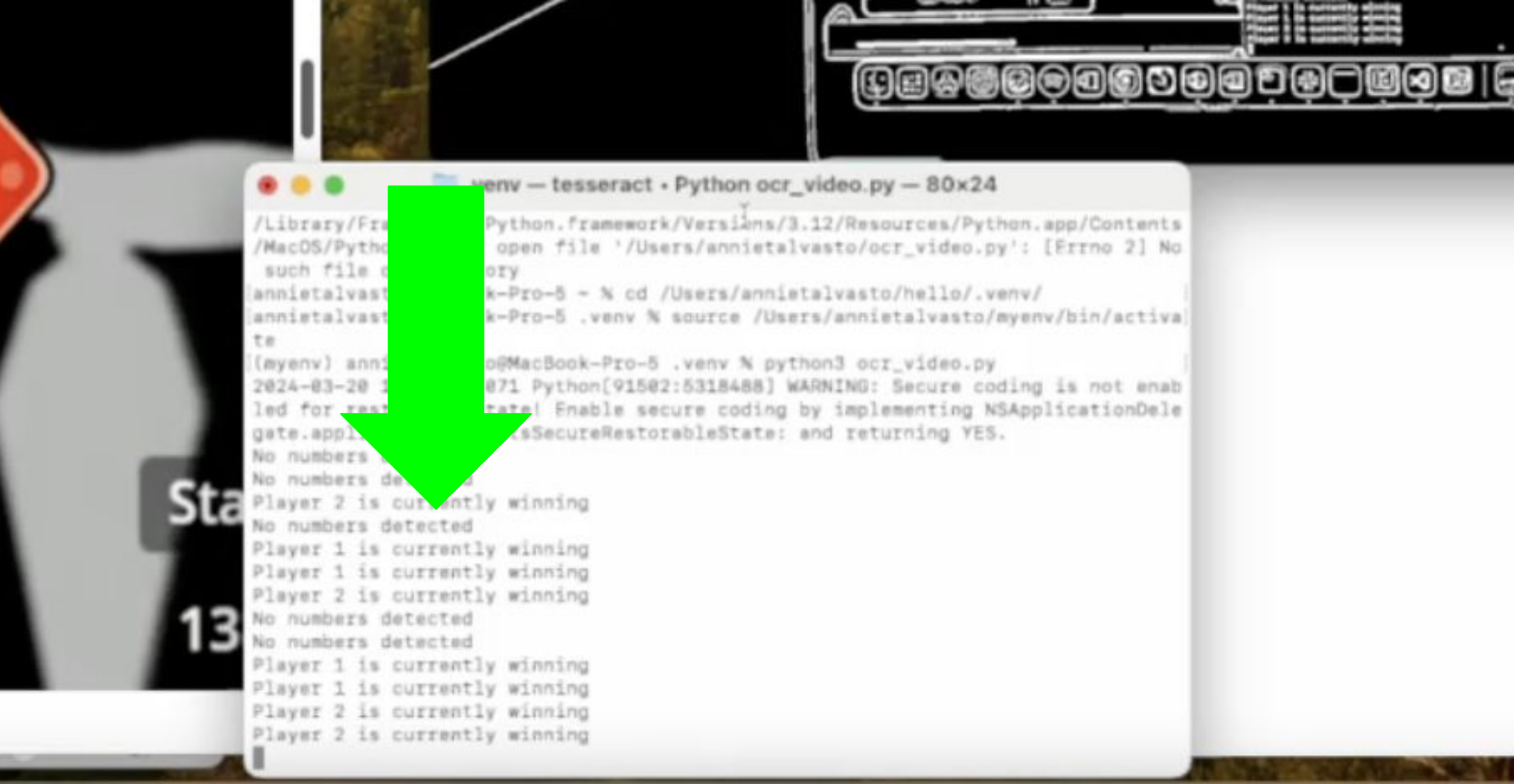
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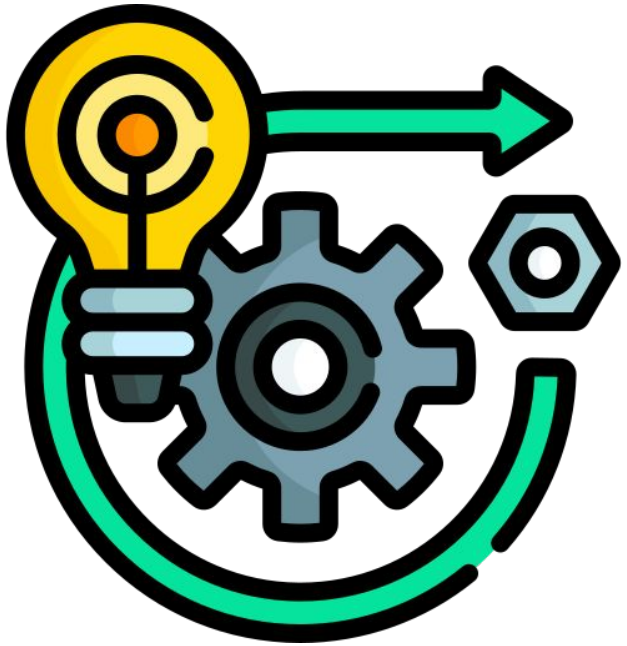
Demo

- Using OCR with OpenCV, Pytesseract & Numpy to determine winning DDR player realtime.

The importance of MLOps

- Most models never make it into production

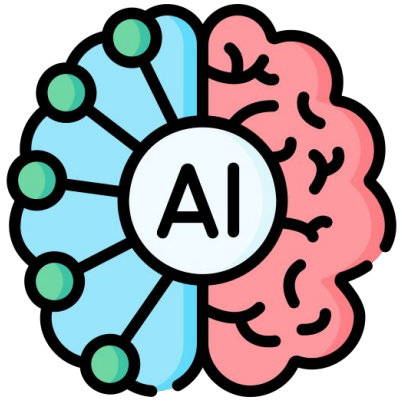


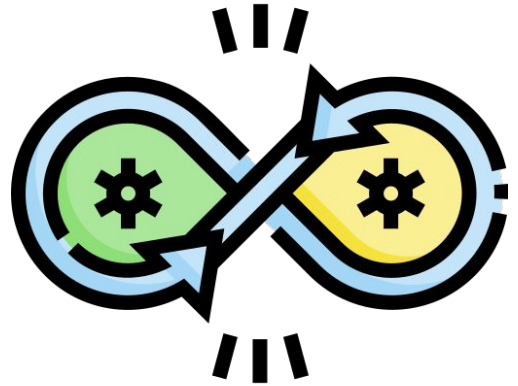
Generative vs Predictive AI

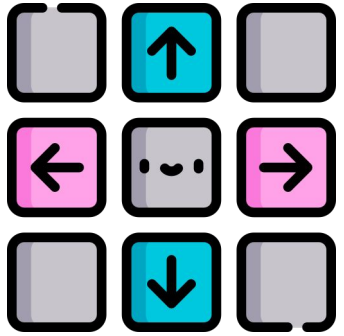
Challenges/Need	Generative AI	Predictive AI
Computational Power	Extremely high. Requires specialized hardware.	Moderate to high. General-purpose hardware can suffice.
Data Volume and Diversity	Massive, diverse datasets for training.	Specific historical data for prediction.
Model Training and Fine-tuning	Complex, iterative training with specialized compute.	Moderate training.
Scalability and Elasticity	Highly scalable and elastic infrastructure (variable and intensive computational demands)	Scalability is necessary but lower elasticity demands. Batch processing or event-driven tasks.
Storage and Throughput	High-performance storage with excellent throughput. Diverse data types. Requires high throughput and low-latency access to data.	Efficient storage with moderate throughput. It focuses more on data analysis and less on data generation; data is mostly structured.
Networking	High bandwidth and low latency for data transfer and model synchronization (e.g., during distributed training).	Consistent and reliable connectivity for data access.

MLOps

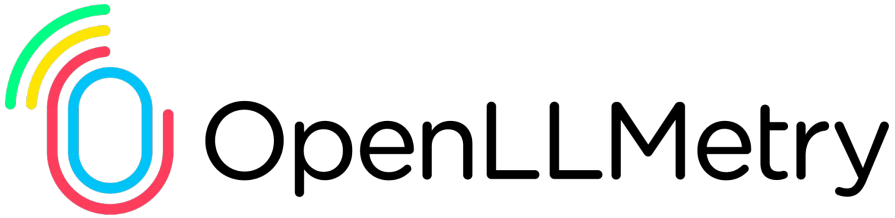
- Kubernetes & Cloud Native
- Data centricity, Model Complexity, Scale et al.
- DevOps Best Practices
- GitOps & others





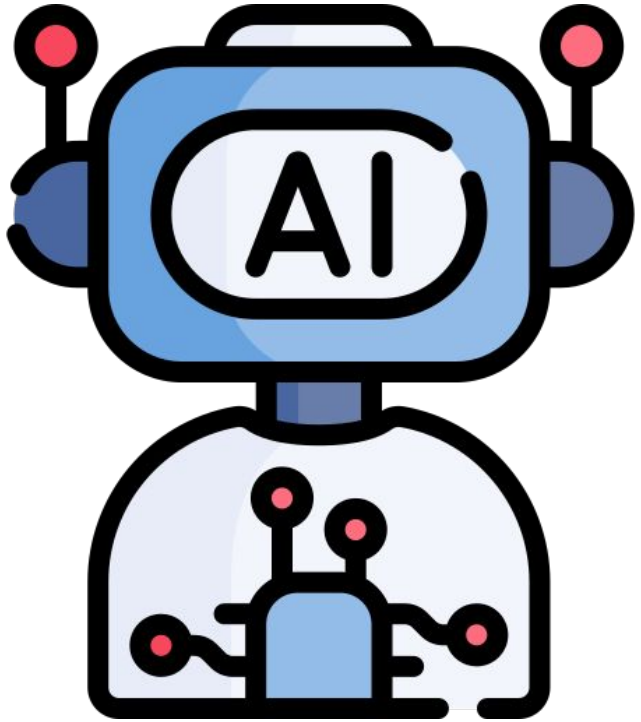


Projects

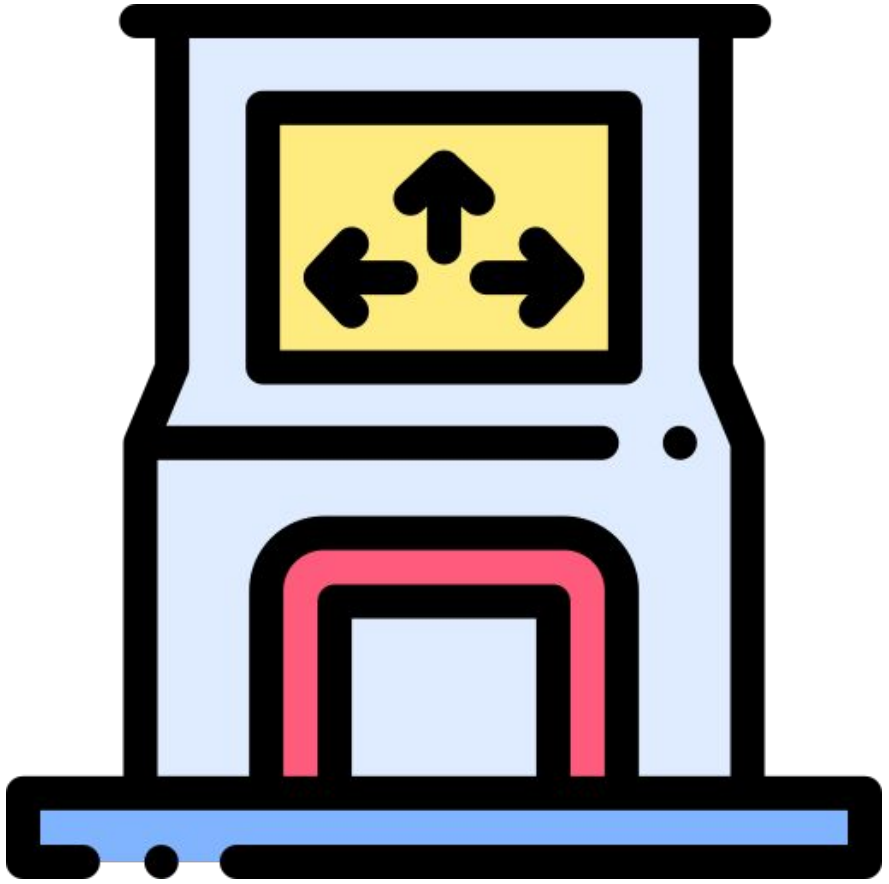


Resources

- **Slides, links & code:** github.com/annietalvasto
- **Practical MLOps** by Noah Gift and Alfredo Deza (O'Reilly). Copyright 2021 Noah Gift and Alfredo Deza, 978-1-098-10301-9.
- **CNCF AI Whitepaper**: cncf.io/reports/cloud-native-artificial-intelligence-whitepaper/
- **Computer vision materials**: opencv.org/



Volunteers from the audience?



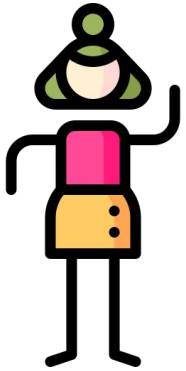
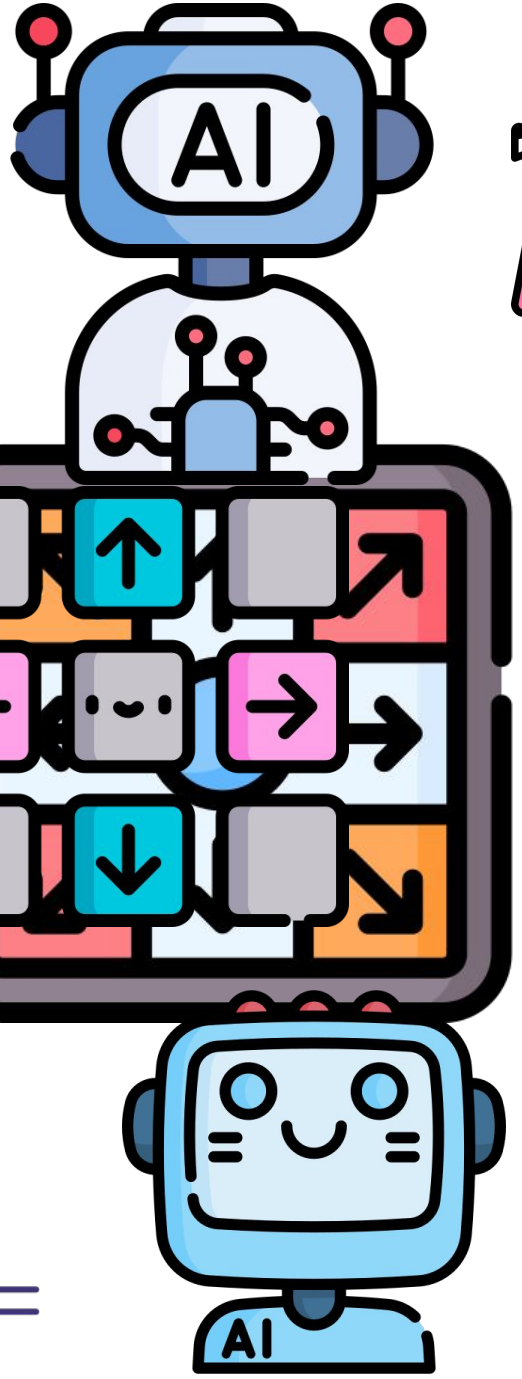
Thank you!

Feedback:

Dance Dance Revolution

- Facts about DRR
- When created
- Open source
- Mentions in media
- Anythigng else?

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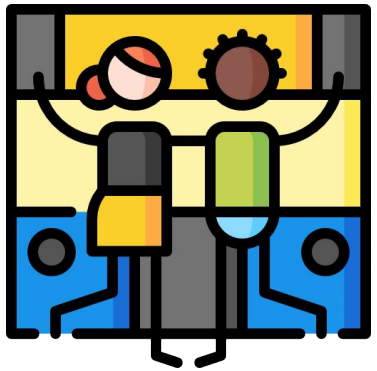
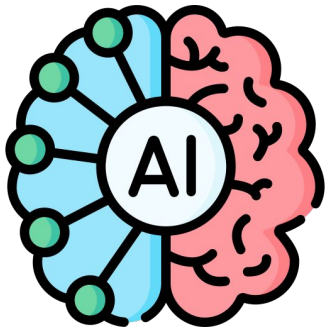

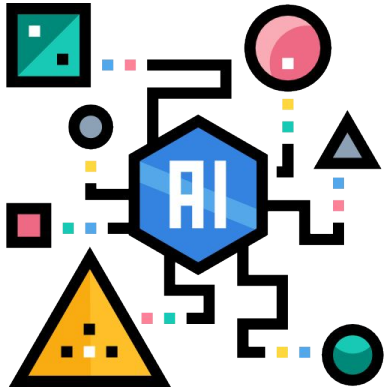
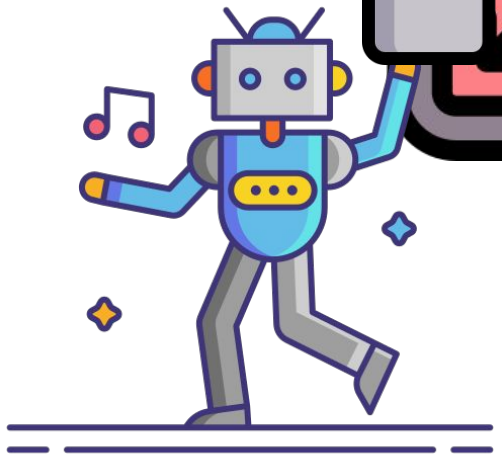
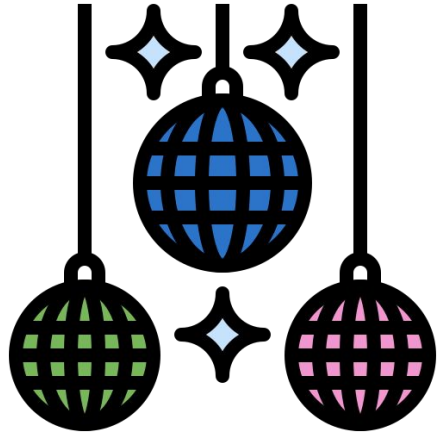
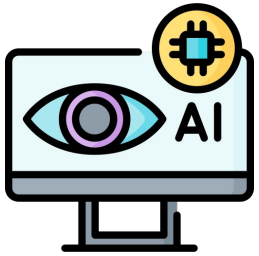

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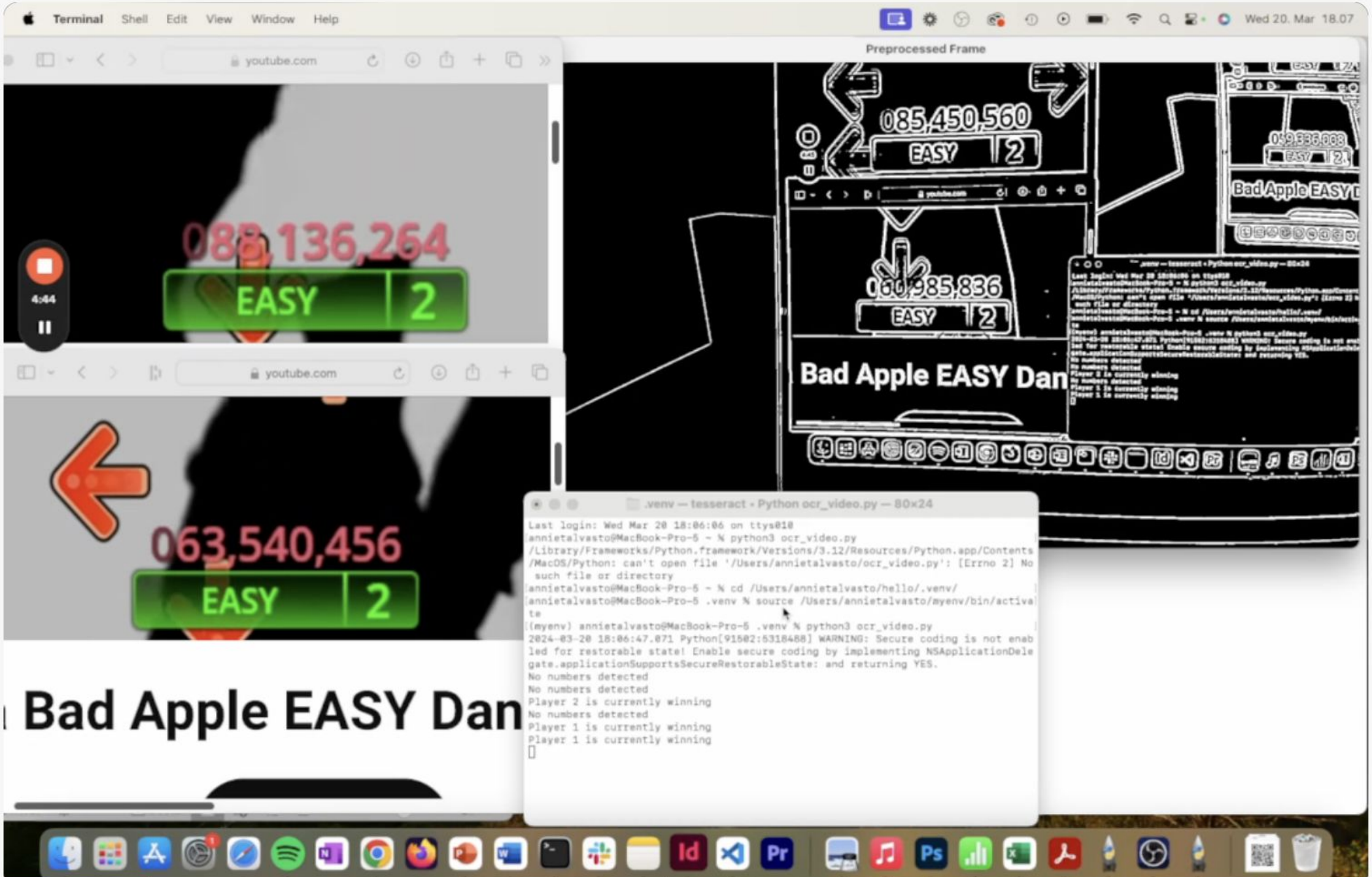
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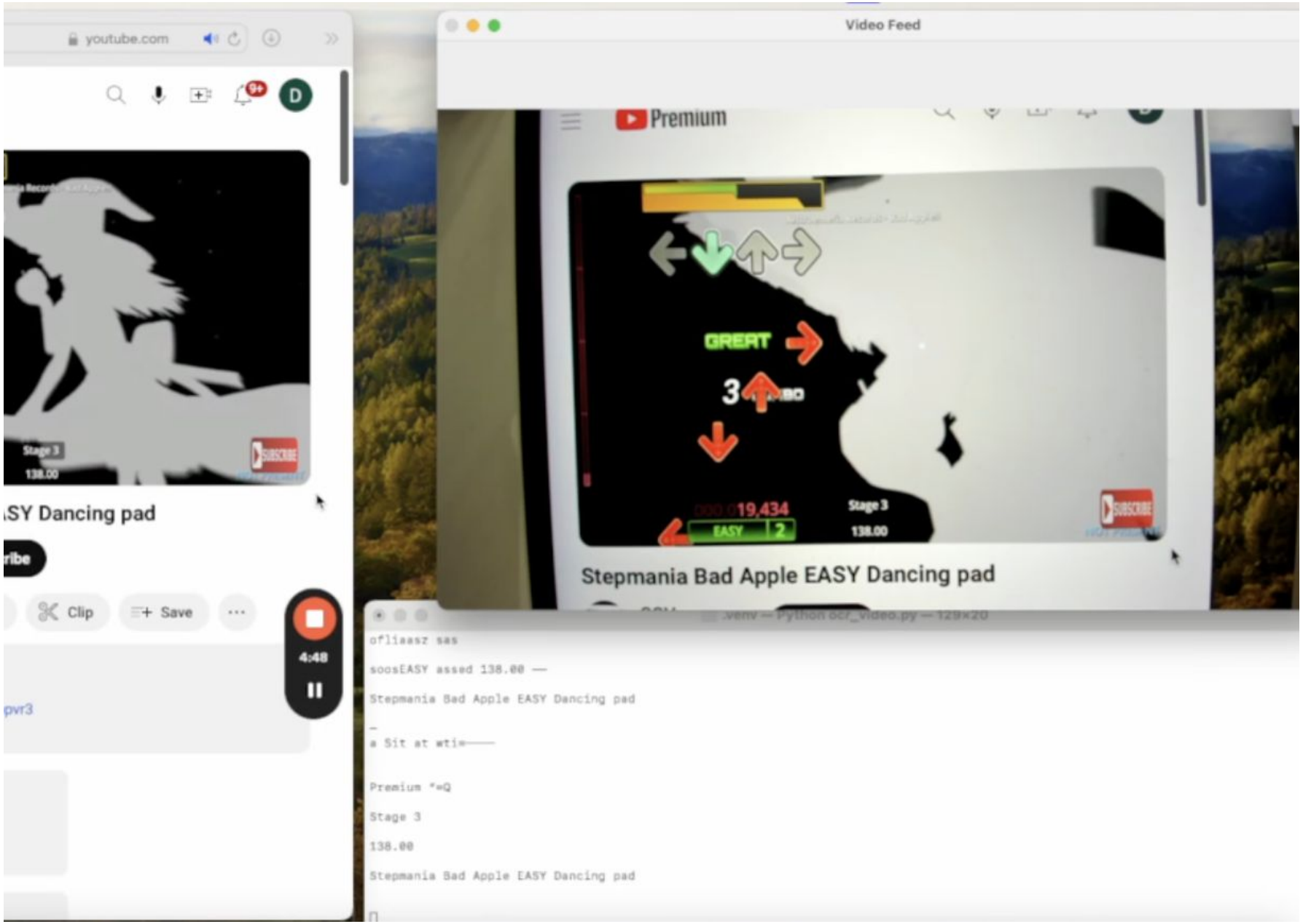
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