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Game Genre Labeling

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Game Genre Labeling



Sports?
Adventure?
Action?
Simulation?
Strategy?
Racing?
RPG?

Can video game genres be classified using screenshots?





Sports
~~Adventure?~~
~~Action?~~
Simulation
~~Strategy?~~
Racing
~~RPG?~~

Can video game genres be classified using screenshots? 

Obtain Labelled Screenshots

570 – Dota 2

Action, Strategy

screenshot_url_1

screenshot_url_2

screenshot_url_3

...



X -

Images/

[appid]_[n]_[genre_encoding].png

560_5_001001000.png

...

...

< >

Dataset: Steam Store API – Games with >1,000,000 owners



Sports



Adventure



Action



Simulation



MMO



Strategy



Racing



Casual



RPG

Model Architecture

- `tf.data` to generate tensors
- Data Augmentation Layer: `RandomFlip`, `RandomRotate`,
`RandomContrast`, `RandomZoom`
- Transfer Learning Layer: `VGG`/`MobileNet`/`NasNet`
- Dense Relu Layers
- Dropout Layers

Model Training

- Macro F-1 Metric
- Macro Soft F-1 Loss Function
- Early Stopping to Reduce Overfitting
- ReduceLROnPlateau to Improve Model Results

Results!



Macro F1 Score (Validation Set): 0.54

	F1-Score
Sports	0.56
Adventure	0.51
Action	0.82
Simulation	0.48
MMO	0.36
Strategy	0.51
Racing	0.71
Casual	0.46
RPG	0.50

Results!



Macro F1 Score (Validation Set): 0.54

	F1-Score	Precision	Recall
Sports	0.56		
Adventure	0.51		
Action	0.82	0.73	0.93
Simulation	0.48		
MMO	0.36		
Strategy	0.51		
Racing	0.71	0.86	0.61
Casual	0.46		
RPG	0.50		

Results!



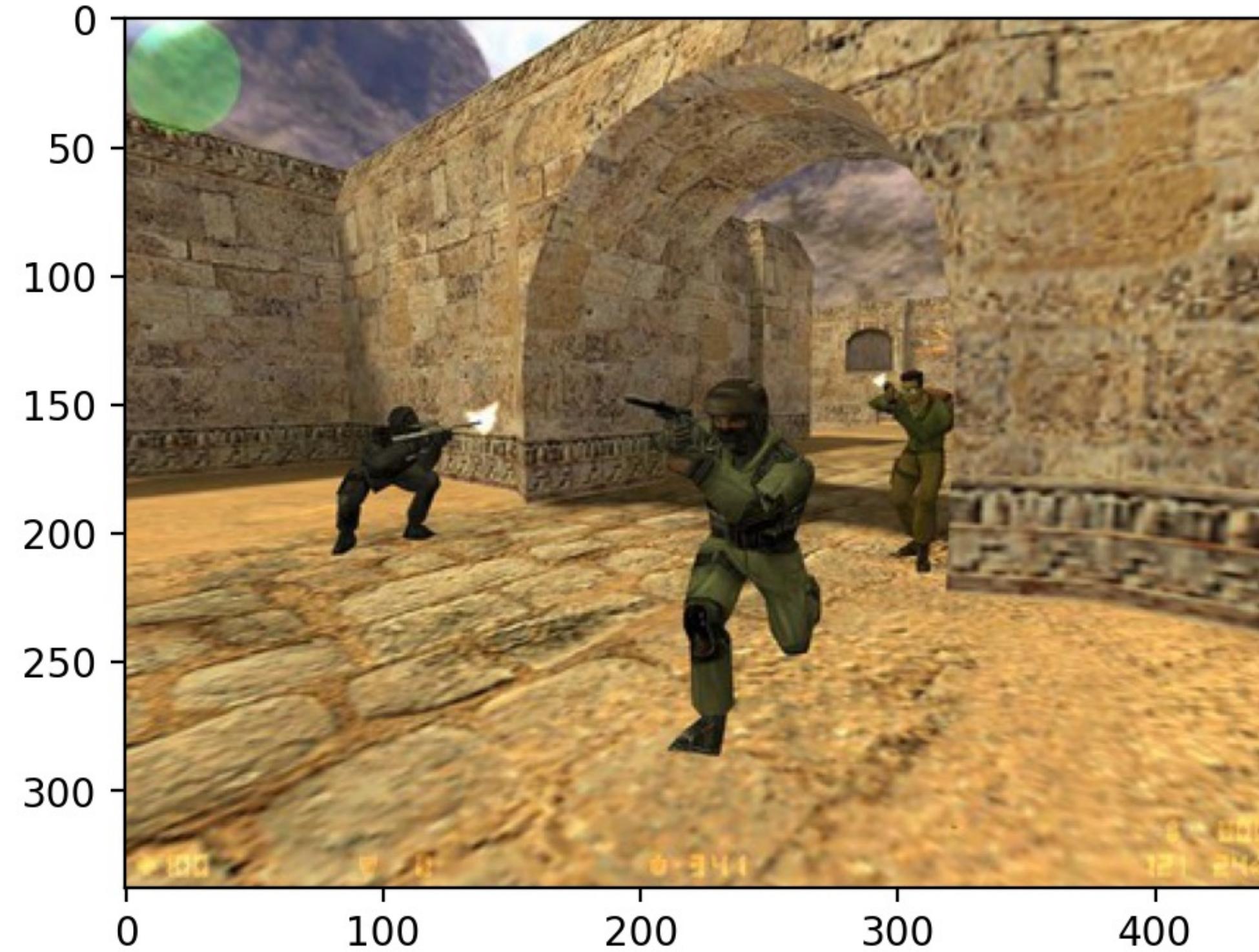
Macro F1 Score (Validation Set): 0.54

	F1-Score	Precision	Recall
Sports	0.56		
Adventure	0.51		
Action	0.82		
Simulation	0.48		
MMO	0.36	0.37	0.36
Strategy	0.51		
Racing	0.71		
Casual	0.46	0.37	0.60
RPG	0.50		

Counter-Strike

Genre
['action']

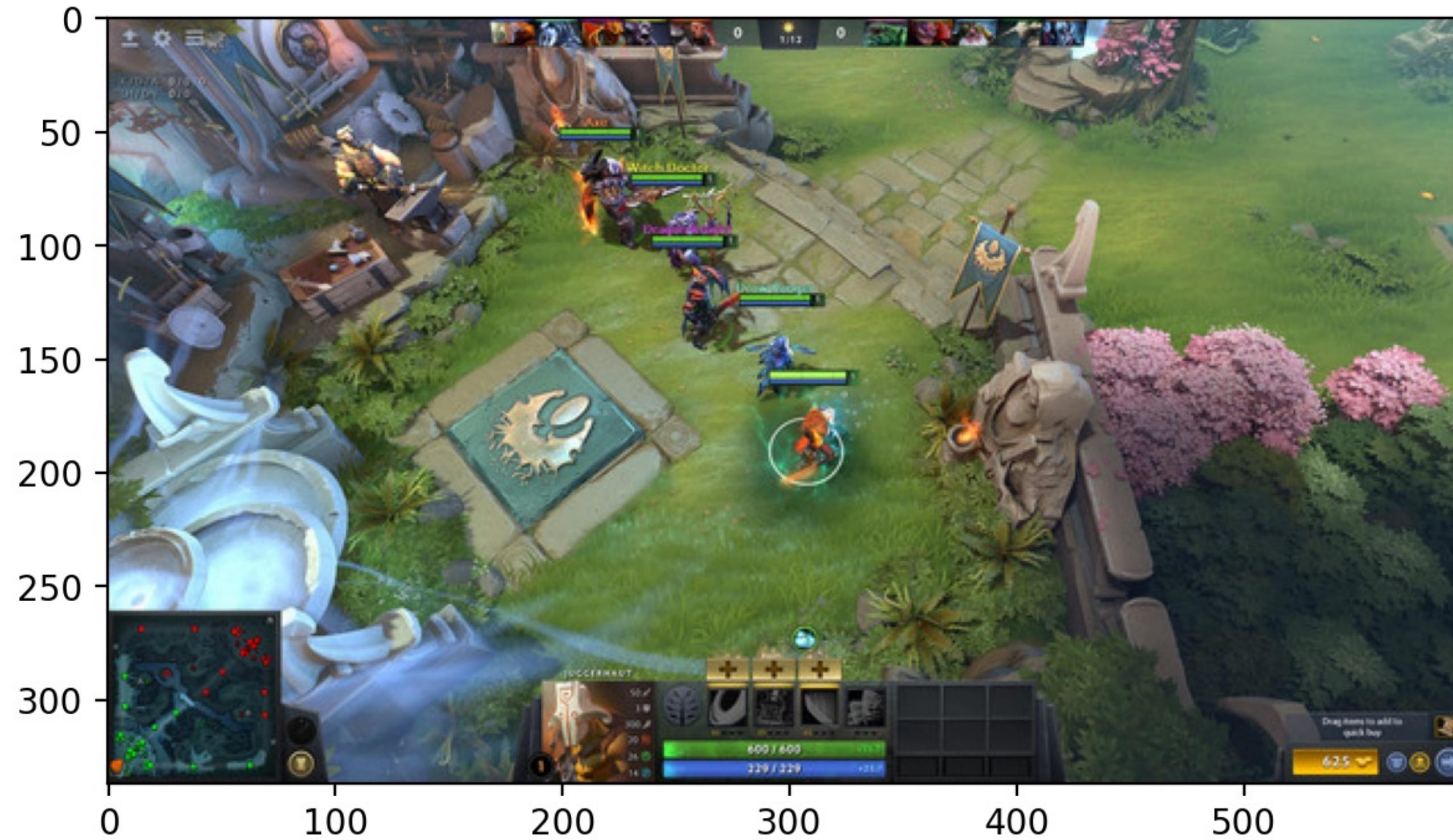
Prediction
['adventure', 'action']



Dota 2

Genre
['action' 'strategy']

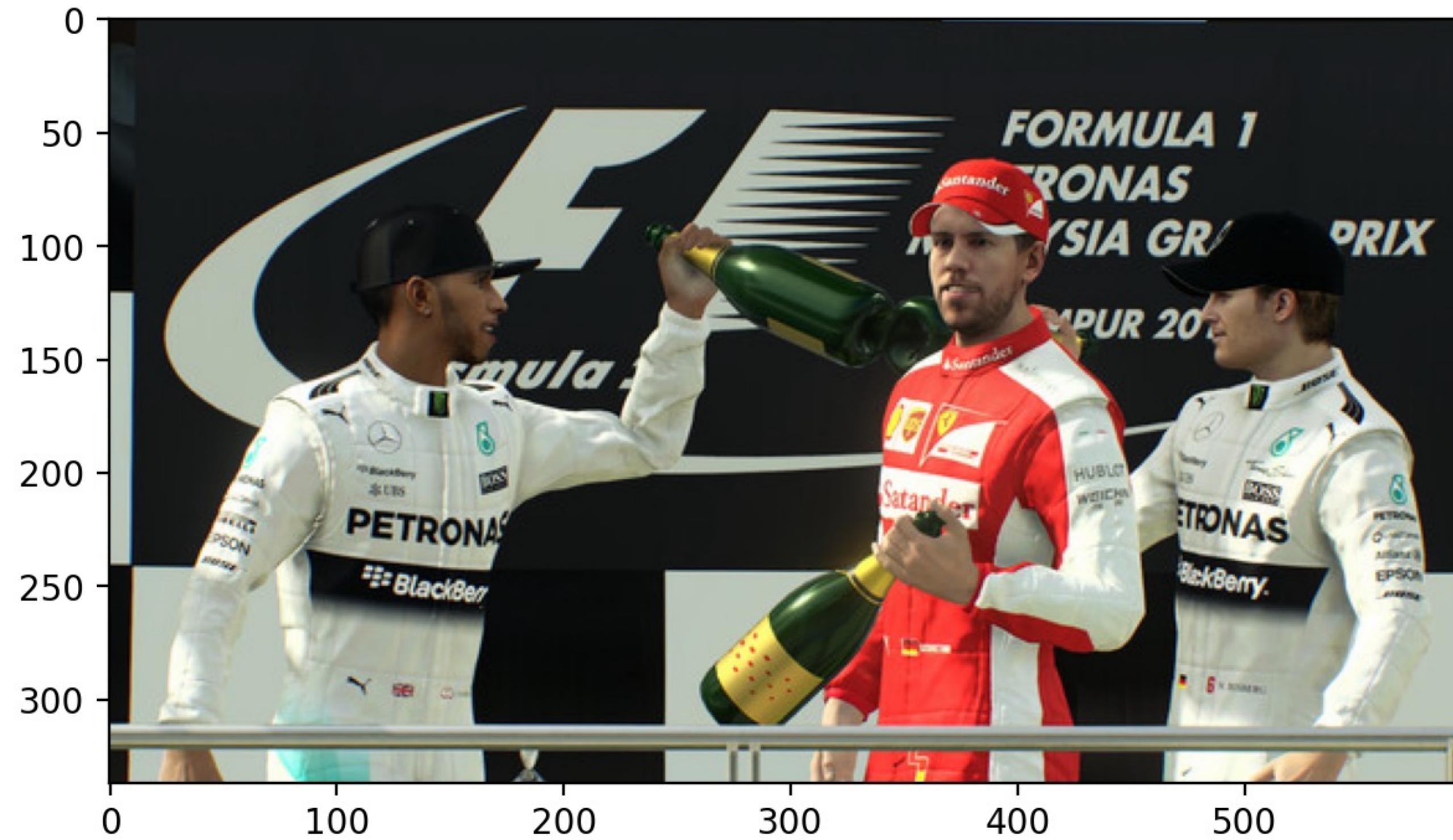
Prediction
['strategy']



F1 2015

Genre
['sports' 'racing']

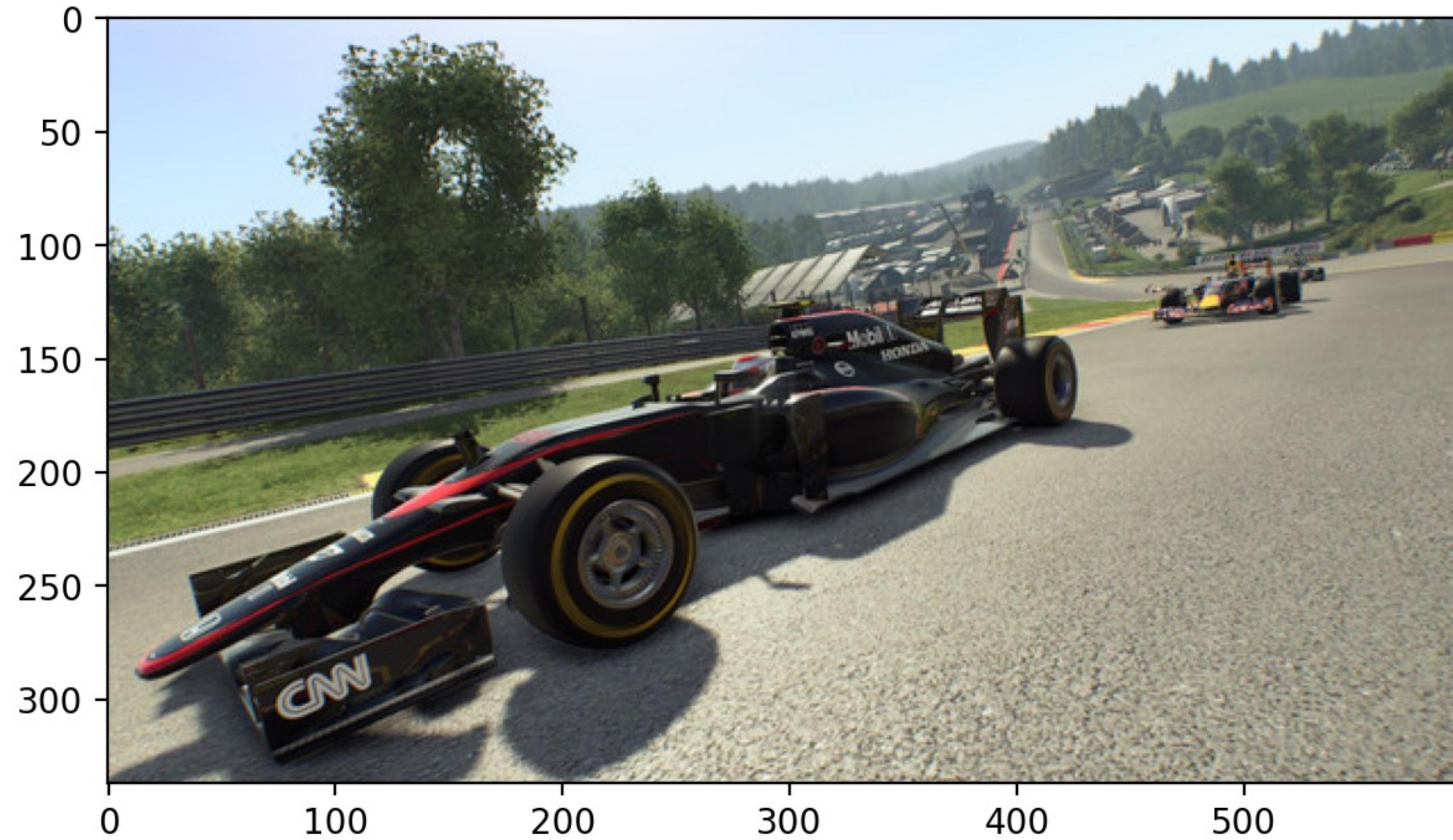
Prediction
['sports', 'simulation', 'casual']



F1 2015

Genre
['sports' 'racing']

Prediction
['sports', 'simulation', 'racing']



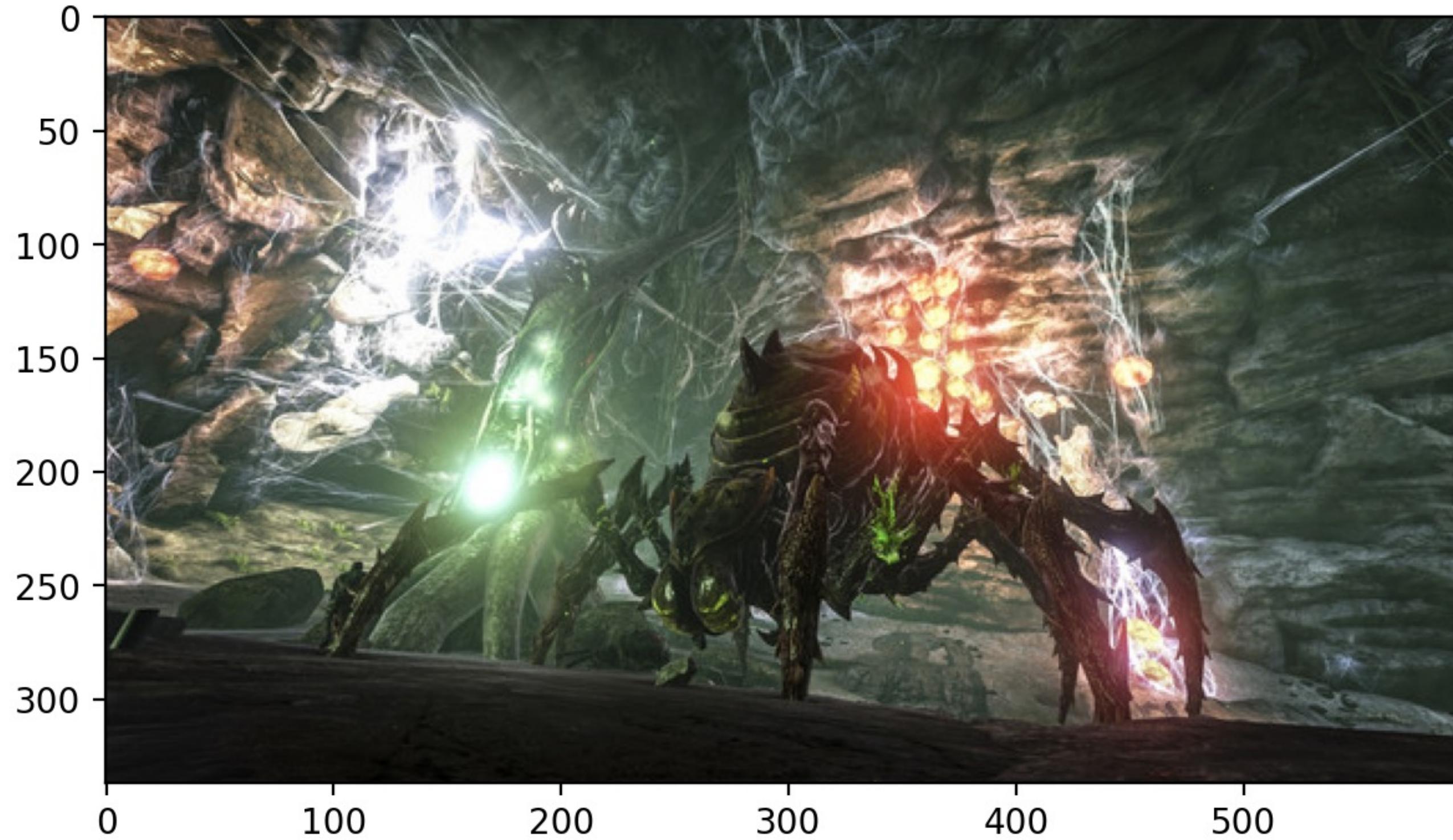
ARK: Survival Evolved

Genre

['adventure' 'action' 'massively multiplayer' 'rpg']

Prediction

['adventure', 'action', 'rpg']



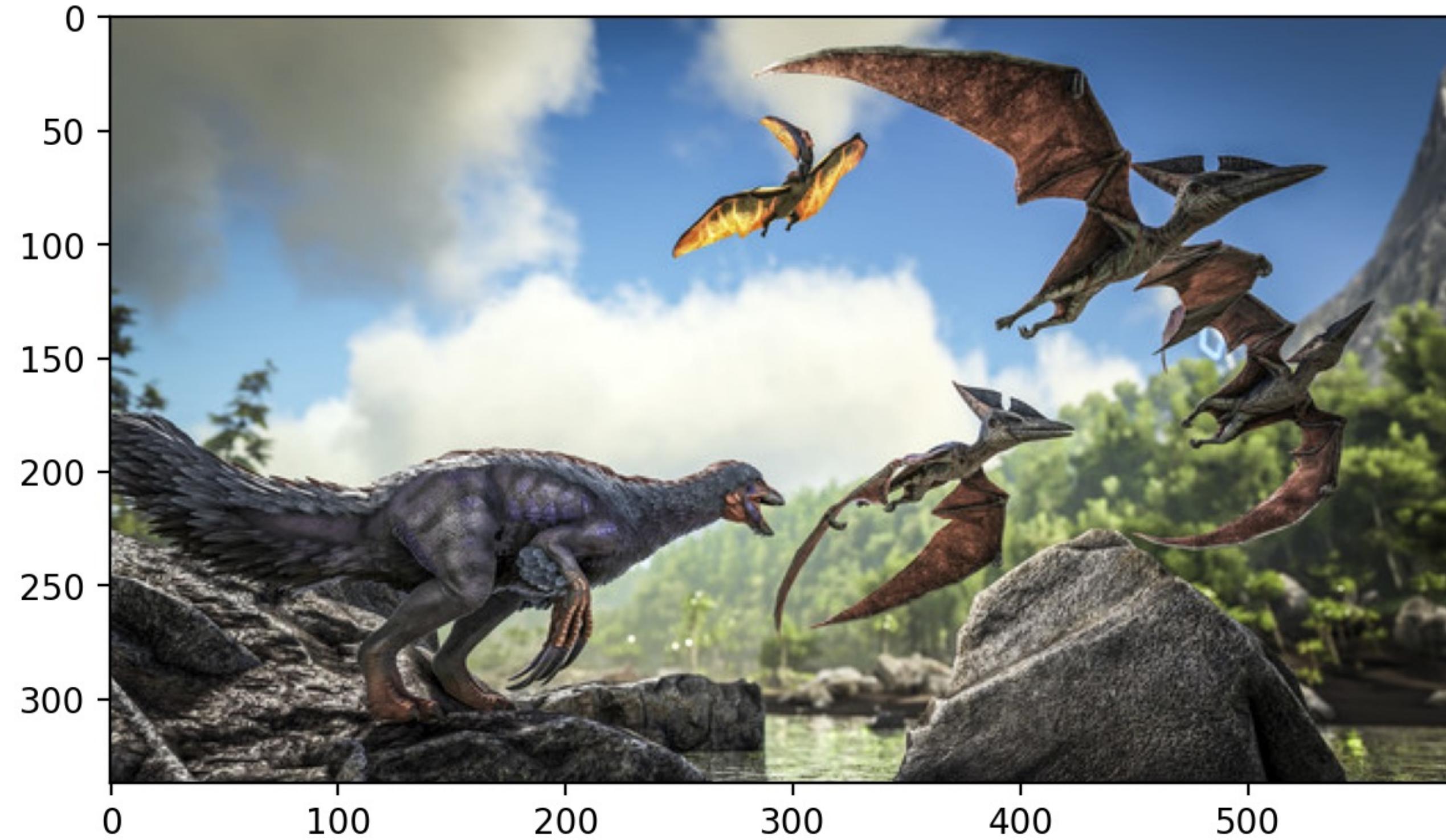
ARK: Survival Evolved

Genre

['adventure' 'action' 'massively multiplayer' 'rpg']

Prediction

['adventure', 'action', 'massively multiplayer', 'rpg']



Conclusions and Future Work

- We can certainly implement an improved version of this solution for VideoStreaming.
- Revisit the labels used for training.
- Incorporate this labelling on screenshots of videos from our platform and use it for our recommendation system.

Thank You



Results!



Macro F1 Score (Validation Set): 0.54

	F1-Score	Precision	Recall
Sports	0.56	0.69	0.47
Adventure	0.51	0.37	0.83
Action	0.82	0.73	0.93
Simulation	0.48	0.51	0.45
MMO	0.36	0.37	0.36
Strategy	0.51	0.55	0.47
Racing	0.71	0.86	0.61
Casual	0.46	0.37	0.60
RPG	0.50	0.42	0.64

Results!



Macro F1 Score (Validation Set): 0.54

	F1-Score	Precision	Recall
Sports	0.56	0.69	0.47
Adventure	0.51	0.37	0.83
Action	0.82	0.73	0.93
Simulation	0.48	0.51	0.45
MMO	0.36	0.37	0.36
Strategy	0.51	0.55	0.47
Racing	0.71	0.86	0.61
Casual	0.46	0.37	0.60
RPG	0.50	0.42	0.64

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