**HELMET DETECTION USING MACHINE LEARNING**

# **Abstract**

This paper aims to improve the solve the problem of motorcycle accidents. To achieve this, a deep learning framework combined of two models will be exploited. .. Image classification problems ++ κάποια στοιχεία για τα μοντέλα που καταλήξαμε, εποχές κτλ

# **Introduction**

- Statistical data about accidents in Greece

- The use of neural networks nowadays

- The reason we choose this project

# **Our project**

-The Business questions the project seeks to solve

- Field of implementation of the ML model

# **Our Vision/Goals**

- Less accidents

- Combination of technology to achieve a better living place

- Money?

# **Methodology**

-The general conceptual description of your methodology

- Architecture in terms of Data/Content Analytics and Machine/Deep Learning ( CNN, VGG19, pretrained models )

- Evaluation protocol, How you plan to evaluate your method ( roc curve, accuracy, precision, recall) ( split to train test and validation set )

# **Data Collection**

The actual data sources from which your data mostly come from

( Kaggle link ) – ama kanoume kai test kai me dikia mas photo

# **Dataset Overview**

Data characteristics, features, most significant attributes (Περιγραφή των annotations me ta bounding box oti deixnoyn to kefali ) , περισσότεροι από ένα άτομο στη φωτογραφία

Dataset descriptive statistics (Εδώ να βάλουμε ποσο balanced είναι το dataset )

*Additional/complementary datasets that might strengthen your analysis but are out of reach within your project cycle*

*(Αυτό δεν νομίζω να το έχουμε)*

# **Data Processing/Annotation/Normalization**

Data pre-processing steps (read the annotations and the photos – crop the images )

Cleansing processes, normalization ( flatten, normalize /255, explanation of 3 channels ( rgb – 3 colors)

Data exploration to spot bias, anomalies, missing values, imputing techniques (missing photos)

Data augmentation techniques etc (rotation, zoom, scaling)

# **Algorithms, NLP architectures/systems**

Any external tools you may think of as part of your solution (Oracle db, library: tensorflow, pytorch, keras,etc. programming language: Python, java, etc. frontend/backend, annotation platform etc.

Models used explained in detail

# **Experiments – Setup, Configuration**

Δεν ξέρω ---

# **Results & Quantitative Analysis (incl. visualizations)**

Evaluation of the models, metrics , plots

# **Qualitative & Error Analysis**

Evaluation and evaluation of how important the error is

Visual example with a test photo if the model works well

# **Discussion, Comments/Notes and Future Work**

- σχολιασμός πόσο καλά έγινε train το μοντέλο

- Προτάσεις πως θα μπορούσε να βελτιωθεί

- Πιθανώς τι δεν πήγε τόσο καλά

- Ισως μεγαλύτερο dataset?

# **Members/Roles**

Alamanis on the desktop

Vasileiou on the comments

Gkini on the crop top

Maria on the Cygwin download

# **Time Plan**

Λεω να μη το αναφέρουμε γιατι θα γελάνε και οι πέτρες

# **Bibliography**

Εδώ πρέπει να ξεκινήσουμε να κρατάμε διάφορα λινκς που διαβάζουμε και θα αξιοποιήσουμε.

# **Appendices**

Εδώ αν βάλουμε το μοντέλο που δεν πήγε καλά?