Andrea Apicella

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SUMMARY

Master student in Artificial Intelligence and Industrial Automation at University of Udine.
Double degree student in Information and Communications Engineering at Alpen-Adria-Universität Klagenfurt.
Researcher on Activity Recognition with a focus on Falls Detection.
My aim is to solve real world problems through innovative yet accessible technologies.
Able to work in a team and lead people with different backgrounds thanks to the skills acquired by co-managing a YouTube channel and producing branded content for some of the top tech brands.

PROJECTS AND RESEARCH

Alt Frailty: Personalized Health Management of Physical, Mental and Social Frailty in the Elderly

Active Ageing Technical Research Group - University of Udine · March 2021 - Present

· **Research, coordination, development, data acquisition, and State of the Art DNN architectures implementation to create a multimodal fall detection and action recognition dataset.**
· **Data acquisition**: setup of multiple broadcast cameras + Inertial Measurements Units (IMUs).
· **Data annotation**: video frames micro and macro labeling using Supervise.ly.
· **Data processing**: Template Matching using OpenCV for timestamps extraction to synchronize cameras and IMUs. Implementation of custom Keras DataGenerators that split video frames features in time-series using a sliding window mechanism.
· **Development and evaluation of Deep Learning models** to detect falls and micro actions in medical elderly care facilities and home environments: **implementation, testing, and performance comparison** of 2D CNN + RNN + Attention, 3D CNN + RNN + Attention, and Video Transformers architectures.
· **Results analysis and deployment:** metrics logging, automatic hyperparameters tuning, and dataset versioning using Weights and Biases Reports, Sweeps and Artifacts.
· **Production of video presentations** to explain the fall detection problem, the research objectives, the new dataset acquisition, and the results obtained.
· **Writing and publication** of a research paper about the project.

Published research paper "Deep Neural Networks for Real-Time Remote Fall Detection"

ICPR International Workshops and Challenges. ICPR 2021 · February 2021

Experimental Thesis "Deep Neural Networks for Real-Time Remote Fall Detection"

University of Udine · March 2020 - October 2020

· Developed a Deep Learning based fall detection system which runs in real-time inside the web-browser, even on low powered machines.
· The fall detection system leverages: PoseNet, a pose estimation model implemented in TensorFlow.js, which detects human body keypoints; a custom trained Convolutional Neural Network based on the MobileNetV2 architecture; a custom LSTM network.
· PoseNet and the CNN extract human body keypoints from a live video feed captured with a RGB camera.
· The LSTM analyzes time-series of such keypoints to determine if a fall occurred.
· The proposed architecture reached state-of-the-art results in terms of latency while running inside the web browser on lower-end GPU than other more accurate models proposed in literature.

Webcam video quality enhancement using Conditional Generative Adversarial Networks

Alpen Adria University Klagenfurt · October 2021 – February 2022

· Acquired a dataset of webcam and cinema camera video pairs. Tested Nvidia's cGANs to enhance the video quality of a webcam and match the look of a cinema camera.
· **Data acquisition**: acquired video pairs of ten subjects with a webcam and a mirrorless 4K cinema camera.
· **Conditional GAN models (cGANs):** trained and compared Nvidia's state of the art pix2pix and pix2pixHD architectures.
· **Writing of a technical paper of** which explains cGAN architectures, the dataset acquisition and processing, and the results obtained.

SKILLS

Deep Learning and Computer Vision: Python, Keras, TensorFlow, TensorFlow.js, Pytorch | OpenCV, Pandas, NumPy | Weights and biases, TensorBoard.
Clusters and Versioning: Git, Github, Docker, Anaconda, Pip.
Web Development: Javascript, HTML5, CSS3, Sass, Bootstrap, React.js | Flask, Node.js, PHP | MySQL

EDUCATION

Master double degree in Artificial Intelligence and Industrial Automation
University of Udine | Alpen-Adria-Universität Klagenfurt · 2022
Bachelor of Science in Multimedia Sciences and Technologies
University of Udine · Udine, Italy · 2020 · 110 Cum Laude

EXPERIENCE

Web content creator, Project Manager and Co-host
Prophecy Tech by NextHardware   May 2017 - June 2018, Rome
· Branded Content, Videomaking, Graphic Design, PR, Customer Care.
· Cooperated with top tech brands: (Intel, Razer, Gigabyte, Corsair) and participated to some of the most important tech events, such as Computex in Taipei.

Reporter – Videomaker Freelance
Ansa.it   September 2016 - May 2017, Rome
· Technology news and video production. Participated to Mobile World Congress 2017 in Barcelona for media coverage.