UXMachines

USE CASE: DEFENCE

HUMAN MACHINE TEAMING IN EMERGENCY SITUATIONS AS BUSHFIRES

AI is becoming part of our daily lives – it's everywhere – we use ChatGPT to get insights or generate new images that go beyond anyone's creativity. How can we as humans efficiently work jointly together with AI to make informed decisions?

The DecAI project is exactly looking for a solution of how aerial drones can jointly with human beings to make decisions. While autonomous aerial vehicles collect data through their camera systems or other sensors, the data needs to be interpreted, and made understandable for human beings. Humans should be able to make informed decisions based on this information. Especially in confusing situations as e.g. bushfires, where different emergency workers need to collaborate to help saving lives and endanger property, AI can be helpful tool to make even better decisions to limit damage. AI has the capability to de-confuse those complex situations that humans can make better decisions of what to do.

Humans and AI need to 'learn' to collaborate jointly to maximize survivability. DecAI solves those challenges by identifying human factors that lead to a better understanding of how this collaboration can take place. DecAI also investigates core AI technologies that are required to enable humans to team up with AI to make even better and more informed decisions in emergency situations as e.g. bushfires.

The project is funded by the Defence Science Center (DSC) Western Australia and a collaboration between UXMachines Pty Ltd and The University of Western Australia.

DEFENCE SCIENCE CENTRE WESTERN AUSTRALIA

AEROphoria
UAV Mission Planning & Analytics Tool

Safety App [video]

AEROphoria App

AI Teaming [WWW]

D.Start IGNITE Impact starts here

Landgate SPUR Location Grants Recipient 2021 Supported by DevelopmentWA

AAUS INDUSTRY CHAMPION INNOVATION TECHNOLOGY FINALIST 2024

30TH BELMONT & WESTERN AUSTRALIAN SMALL BUSINESS AWARDS 2023

UXMachines

Teaser [video]

Our vision [video]

Software, AI & Autonomous Aerial Drones

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UAVs

Custom UAVs and AI Payloads [WWW]

CUSTOM BUILT AERIAL DRONES

Avionics: CubePilot Orange+ (STM32H757 Dual Core M7+M4), Pixahawk (up to 6X), *or select your preferred one*

Frame Options: quad-, hexa-, octocopter (carbon fiber, ABS)

MTOW: <25kg **Endurance:** 20-40min **Power:** 10-25Ah, 6-12S

Payloads: MAVLink, standard payload rails, custom payloads up to 10kg (e.g. Gremsy, Sony cams, MicaSense, NextVision)

Connectivity: 12V/3-5A, 5V/3-5A, serial, CAN, USB, RTK GNSS, RFD900X link,

We build our drones with off the shelf hardware—fully customisable: lidar based object avoidance, IR landing/target recognition, services, multi-band RTK GNSS, remote ID, live video transmission, servo controls, edge AI payloads, ...

HUMAN-AI-TEAMING

NEW WAYS OF INTERACTING WITH DRONES

Rather than focusing on drone flying, operators should interact with drones on mission, intension, and goal level.

We develop new ways how autonomous aerial drones collaborate with humans. We work on high performance situations as bushfires to help to save lives.

AI Teaming [WWW]

SOFTWARE & AI

AI COMPANION COMPUTERS

We develop custom software for aerial drone companion computers for different purposes. We connect payloads through MAVLink or other bus systems according your specifications.

Use Cases: object tracking, live stock monitoring, detection of changes on ground over time, flightpath planning, reconnaissance, encrypted edge AI, decision support, GPS denied operations

Architectures: Nvidia (quad core Arm A57 @1.43GHz, 4GP), Rasberry Pi (quad core Arm A76), MAVLink compatible

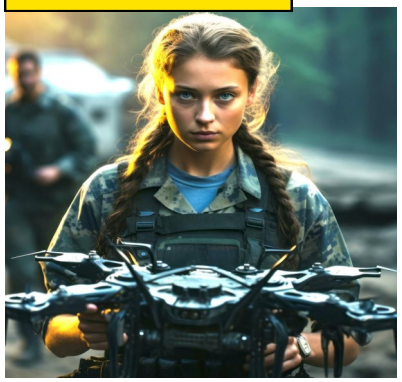
Software Stacks: JetPack 5.1.2+, CUDA TensorRT (e,g. classification, object detection), OrbSLAM2, cuDNN, Vulkan, DLA, OpenCV, Python (Scikit, SciPy, NumPy)

Raspberry Pi

NVIDIA

UXMachines

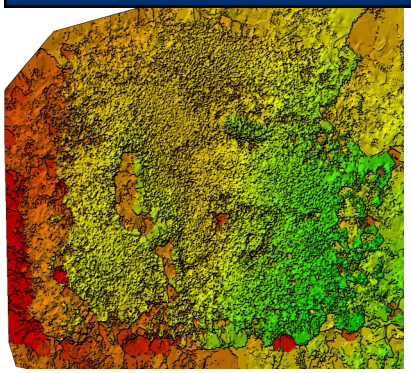
SERVICES



- CONSULTING
- DATA WORKFLOWS
- UX & UI DESIGN
- INNOVATIONS & R&D
- DRONE MISSIONS

Services [WWW]

USE CASES: AGRICULTURE



LIVESTOCK MONITORING
PLANT HEALTH
WATER MANAGEMENT

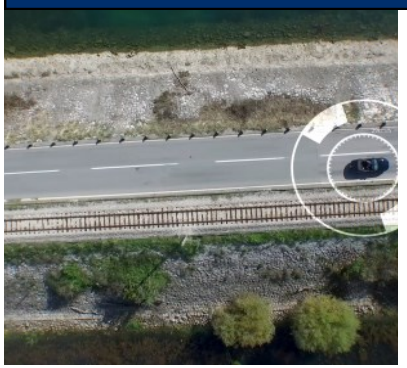
We provide customized solutions in digital agriculture through our aerial drone missions.

We create orthomosaics and DSM to examine plant health to maximise profits.

Keylines, contour lines, and agriculture lines support efficiency. We gather and prepare data to match with your Trimble systems.

Agri use cases [WWW]

USE CASES: INSPECTIONS



ASSET INSPECTION: DECAY, RUST, ARTEFACTS, OBJECT DETECTION, RECONNAISSANCE, CHANGES OVER TIME

We provide you with your custom image processing solution to detect rust, detect objects, track objects, decay, or changes over time. Contact us to create value out of your data.

Analytics use cases [WWW]