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Igor Klymenko

Robotic Engineer

Summary of Qualifications

For the last few years, I was actively working on my military research in Ukraine with the goal of finding landmines under and on the surfaces at landmine areas. With a total experience of 48 months in app development and robotic engineering, I was developing web, mobile, and desktop applications. My interest in the IT field came to me in 2014, and at that time, I started working on my first team research which included graphical programming. After starting engineering research in 2020 with my team, we received more than 15 awards worldwide and 35-40 publications. Since that time, I was developing in myself fast learning and team working skills. This allowed me to be able to study at two universities at the time and lead social events to support Ukraine. For now, I continue working on myself to learn more about robotic engineering and broader my field of knowledge.

Skills

Programming Languages/Technologies

- JavaScript
- XML
- C#/C++
- Python
- NumPy/Pandas/OpenCV
- HTML/CSS

RDBMS

- MySQL

Virtualization Tools

- Docker

Methodologies

- Agile, Scrum, XP
- Waterfall

Operating Systems

- Microsoft Windows
- Ubuntu Linux
- macOS

Frameworks/Libraries

- ROS2 Humble
- Unity
- DJI SDK

Application/Web Servers

- GitHub

Development Tools

- Visual Studio
- PyCharm
- Sublime Text
- Arduino Software
- MATLAB

Hardware

- Arduino UNO
- Raspberry Pi 4
- Zond GPR/GPR
- RTK systems
- DJI drones M3/M30/M300 series
- DJI drones Agras T10/T40
- AltaX Freefly
- DJI Tello

Drone software

- UgCS
- Pix4DScan
- DJI Pilot 2
- DJI Assistant

GIS systems

- QGIS
- ArcGIS Pro
- WebODM
- DJI FlightHub 2
- Hyperspec III

LiDAR data analysis tools

- RockCloud
- WebODM
- DJI Terra

Experience

Unmanned aircraft used for scanning areas for UXOs

Project Description: A quadcopter mines detector is research related to devices for remotely locating and providing the exact coordinates of explosive objects. The main concept is electromagnetic and optical research of surfaces in order to detect explosive devices regardless of their parameters and data transmission in the format of three-dimensional images to specialists using an unmanned aircraft.

Customer: Own research (Ukrainian army)

Involvement Duration: 39 months

Project Role: Project leader and Software Engineer

Responsibilities:

- Architecture and design;
- Product designer;
- Knowledge sharing, coaching;
- Development of the technology based on metal detectors
- Development of the technology based on Ground Penetrating Radars (GPR)
- Estimation, prioritization, and distribution of tasks;
- Code development for controlling drone and calculating coordinates of UXOs;
- Prototype testing and analysis of results;
- Product support and documentation maintenance;
- Presentation of the product;
- Negotiation with investors;
- Team leading;
- Budget management;
- Financial analysis;
- Drone pilot and developer.

Project Team Size: 4-8 team members

Tools & Technologies: +; JavaScript; MS Visual Studio 2018/2020; Arduino Software; Arduino UNO; self-made technologies based on principle of metal detection; DJI Tello drones; self-upgraded drone technologies

Drifting trials for spraying drones Agras T10/T40

Project Description: Research with the goal of learning the effect of winds perpendicular to the flight of the drone on the spraying range and placement of droplets. Using heights of 1.5-8.0 meters, 10-40 liters of water in a tank we measured the drift of spraying process.

Customer: Canadian company

Involvement Duration: 3 months

Project Role: Data analyst and a drone pilot

Responsibilities:

- Planning flight mission;
- Measuring weather conditions;
- Placing and scanning data from water sensitive paper;
- Analysis of the data from water sensitive paper;
- Fixing broken parts of the unmanned aircrafts.

Project Team Size: 5-8 team members

Tools & Technologies: DropScope; Excel; DJI Agras app; Weather station

Scanning areas for high resolution multispectral data

Project Description: Using a significantly accurate camera and AltaX drone for getting ultra-high resolution multispectral data for satellite calibration.

Customer: Canadian company

Involvement Duration: 2 months

Project Role: Assistant of drone pilot

Responsibilities:

- Planning the flight mission and calibrations;
- Assisting pilot while flying the machine;
- Transferring and exporting multispectral data for the customer.

Project Team Size: 3 team members

Tools & Technologies: UgCS; Hyperspec III; AltaX application for the RC

Creating a contours map for orienteering project

Project Description: The customer asked for a 3d model of the specific area, which would include the classification of the layers and displayed a DEM model with contours. Using DJI M300 and DJI LiDAR sensor we got data of the area. After that the data was changed and prepared with the customer's order details.

Customer: Canadian orienteering company

Involvement Duration: 1 month

Project Role: Data analyst

Responsibilities:

- Cleaning the data from noises;
- Machine learning classification of the layers;
- Creating DEM model;
- Preparing contours and elevation model for the final product.

Project Team Size: 3 team members

Tools & Technologies: DJI Pilot 2; QGIS; ArcGIS Pro; Python; Pix4DFields; DJI Terra; WebODM; RockCloud

Using computer vision for controlling the drone

Project Description: With using hand gestures and movements the user can control the drone. Using python OpenCV the algorithm was already created for the DJI Tello drone. The second part of the project is an improvement of the algorithm with using ROS2 systems and Raspberry Pi 4 for swarming drones.

Customer:	Canadian company
Involvement Duration:	3 months
Project Role:	Software developer
Responsibilities:	▪ Development and design of architecture; ▪ Modules and code development; ▪ Testing units; ▪ Piloting drones
Project Team Size:	1 team member (me)
Tools & Technologies:	Python; Ubuntu Linux; Raspberry Pi; Docker; DJI Tello drones;

Certifications

Pilot Certificate of Basic Operations 2023	
UF startup school beginner certificate 2022	
Duolingo English Test certificate 2022	

Education

Degree in process

- University of Alberta, Computing Science, Honors (Canada)
- Kyiv Polytechnic Institute, Engineering faculty (Ukraine)

Languages

- Ukrainian (C2)
- English (C1-)