



Institute of Informatics and Mechatronics

Bachelor's Thesis

in the field of study of Computer Engineering and Mechatronics

Cloud Managed Unmanned Aerial System

Bruno Axel Kamere

Student's transcript number **030756**

Seminar conducted by

Szychta Elżbieta, prof. dr hab. inż.

Thesis supervisor

Ocetkiewicz Tomasz, mgr inż.

Bydgoszcz, Poland 2022

This work is dedicated to my loving and very supportive parents . . .

Acknowledgements

Throughout the design, development, test, and documentation of my project, I have received a great deal of support and assistance, and I want to take a moment to recognize all those that have supported me both morally and financially.

I would like to first thank my parents Emmanuel Kamere and Florence Nibakure very much. Saying thank you in words would not be anywhere close to enough. You have supported me both financially and mentally in every step of my project development, given me guidance on how to best approach and tackle all kinds of blockers I would encounter along the way. You have been one of the key pillars of my project's implementation success.

Next, I would like to thank my supervisor Tomasz Ocetkiewicz. First for believing in my ability to complete this project and second for the unprecedented advice and support you have given me throughout the realisation of my project. While looking for a supervisor to help me get my project to life, I didn't hesitate to choose you mainly due to the competences that I have seen in you in the engineering area during my time at WSG university and the classes that we have had together.

I would also like to thank the whole computer engineering and mechatronics department for all the support that they have given me throughout my time at WSG university, the accesses to the labs, all the materials I have been able to get from you and finally all the knowledge and inspiration that you have given throughout my time at the university.

Finally, I wouldn't finish without thanking each one of my classmates, colleagues and friends who have been part of my support system and have given me ideas and support during the development of this project as well as my time at WSG. YOU ROCK!

Cloud Managed Unmanned Aerial System

Abstract. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Keywords: AWS, UAV, UAS

DECLARATION

I, the undersigned,
student of the University of Economy in Bydgoszcz, declare that the following
Bachelor's/Engineering/ Master's/ Thesis* entitled
.....

has been written on my own. It means that:

- 1) during writing the thesis I have not used any help from other people (apart from necessary the consultations conducted within the didactic process), mainly I have not commissioned writing the thesis or it's part to other people and I have not rewritten it or its part from other people;
- 2) After the use of the literature and source materials I have mentioned the author, the title and the source according to the quotation rules.
- 3) The thesis and its fragments has not been used as the basis of other procedures aiming at conferring degrees and academic and professional titles;

I declare that I am aware that if my thesis infringes rights connected with copyright and diplomatic regulations, it may be invalidated by the University even after the degree examination.

I also declare that the media attached and the version in the Electronic System ISAPS contains all files connected with the following thesis, which have been used in a printed version.

I prove the authenticity of the above declaration with my handwritten signature

Bydgoszcz, y.
(signature)

DECLARATION OF AUTHOR'S WILL

Surname and name of the author.....

The title of the thesis

.....

Address of Residence

I agree to make above mentioned thesis of my authorship available for scientific and didactic purposes with the consent of the Supervisor. The form of sharing includes: sharing of a printed copy and sharing of its electronic version.

Bydgoszcz, y.
(signature)

*delete as appropriate

Contents

List of Figures	xi
List of Tables	xiii
1 Praefatio	xv

List of Figures

1.1	Tradycyjne godło Politechniki Warszawskiej	xv
1.2	Współczesne logo Politechniki Warszawskiej	xvi

List of Tables

1 Praefatio

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. [1] Nam dui



Figure 1.1. Tradycyjne godło Politechniki Warszawskiej

ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna.

Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa. Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel

Politechnika Warszawska

Figure 1.2. Współczesne logo Politechniki Warszawskiej

justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

References

- [1] M. Goossens, F. Mittelbach, and A. Samarin, *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993.