

**ATILIM UNIVERSITY**

**FACULTY OF ENGINEERING**

**DEPARTMENT OF INFORMATION SYSTEMS ENGINEERING**

**ISE 399 SUMMER PRACTICE I REPORT**

### **Prepared By**

## Yusuf Emre Konuk

**21243610047**

**Sept. 6, 2024**

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***INTRODUCTION***

Atılım University, Information Systems Engineering, requires a compulsory internship in the summer before the 5th semester and the code of this course is ISE399. I completed this internship for 3 months at the Bernoulliborg Institute, University of Groningen in the Netherlands (*Rijksuniversiteit Groningen, public research university)*, integrated into the Erasmus+ Internship Mobility Program.

During my internship, I focused on building a strong foundation in cybersecurity within a collaborative academic environment. I also conducted a comprehensive literature review for the project, "Automating Security Analysis of In-App Payment Libraries in Android APKs," and shared my findings with my supervisor [Fadi Mohsen, M.S., Ph.D.](https://www.linkedin.com/in/fadimohsen/), aiming to make meaningful contributions to the project's progress.

**bulut, dış mekan, gökyüzü, bina içeren bir resim

Açıklama otomatik olarak oluşturuldu**

Figure 1: The Bernoulliborg in 2022, seen from the Energy Academy Europe

***DESCRIPTION OF THE COMPANY***

**Bernoulliborg Institute**

The Bernoulliborg is a building of the University of Groningen located on the Zernike campus. It offers space for 350 employees and 500 students. Departments such as Mathematics and Computer Science are processed in this building. This building is mostly where teachers have their offices and do their research. Also, students who are doing doctorate, master's and internship like me can have an office in this building.

**The University of Groningen**

(Dutch: *Rijksuniversiteit Groningen*) is a [public](https://en.wikipedia.org/wiki/Public_university#Continental_Europe) [research university](https://en.wikipedia.org/wiki/Research_university) in the city of Groningen in the [Netherlands](https://en.wikipedia.org/wiki/Netherlands). This university is one of the oldest in the Netherlands and is a well-established university. Also The University of Groningen frequently ranks among the top 100 university in world rankings.The University of Groningen has more than 10 faculties and nearly 30 research centre institutes. The university's alumni include Nobel laureates, the head of the [European Central Bank](https://en.wikipedia.org/wiki/European_Central_Bank),and the secretary of [NATO](https://en.wikipedia.org/wiki/NATO). Many projects are carried out at this university thanks to the support of the European Union and international students are frequently preferred for these projects.

**dış mekan, gökyüzü, yol, karayolu, saray içeren bir resim

Açıklama otomatik olarak oluşturuldu**

Figure 2:The 20th-century main building in 2009

***DESCRIPTION OF THE WORK DONE***

***iç mekan, bilgisayar, bagaj ve çantalar, duvar içeren bir resim

Açıklama otomatik olarak oluşturuldu***

During the internship process, upon the request of my supervisor, I was given a desk in an office opposite the my supervisor's office where there were 3 PhD students. Then my supervisor introduced me to the employees on the floor. I had no idea that I would have a very enjoyable summer internship with the professors, doctors and doctoral students there. I especially got along very well with the 3 doctoral students in my office. It was a great feeling to be abroad for the first time and speak English with people. Afterwards, I got to work.

A person standing in front of a screen

Description automatically generated

Figure 3:A view from my desk in the office

**First Month**

In the early stages of my internship, I started my job by examining the files, C codes and a detailed report sent to me by my supervisor. During this process, my supervisor maintained close communication with me and visited my office frequently. He helped me with the questions and topics in my mind and told me about the cyber security tool they were trying to make. During this period, master's students and undergraduate students were presenting their term projects and master's students were preparing their defense theses. My supervisor, who wanted me to see these closely and get to know different areas of computer science, invited me to such events. These events were really productive and I had the opportunity to meet many people from the computer science sector.

Figure 4:Presentation of a bachelor's project

**A person sitting in a classroom

Description automatically generatedSecond and Third Months:**

When I entered this period of my internship, I was very focused on my supervisor's project and spent most of my day doing literature review. In parallel with the literature review, I was also learning the basics of cyber security.

In this way, I could more easily understand the cyber security terms in my supervisor's main project. For example, when I saw concepts such as man-in-the-middle attack or social engineering in cyber security somewhere in the project files, I could understand them because I had an idea about them. I used resources such as ResearchGate for literature review. While learning the basics of cyber security, I followed a Udemy course approved by my supervisor. I was doing the cyber security exercises on my office computer using Kali Linux. At first, I didn't even know what the command line was, but later I learned how to do many operations on Kali Linux with command line, which I installed on my Macbook device with the UTM virtual machine, and even solved Wifi security using a Wifi card. Then I finished my literature review and shared the files with my supervisor every Friday. My supervisor closely followed the weekly update and tried to help me. At the end of 3 months, I had found many studies and classified the documents that would be useful to my supervisor. I shared the final version of the literature review with my supervisor and at the same time we had face to face meetings about what I had learned in terms of the basics of cyber security and my internship ended.

Figure 5:A master's graduation defense

A close-up of a document

Description automatically generated

Figure 6: Title and subject of the literature review

**My Literature Review Topics**

Topic 1: Detecting third-party libraries used in Android apps, including payment libraries.

Topic 2: Scanning third-party libraries used in Android apps, including payment libraries, for security vulnerabilities.

Topic 3: Detecting and scanning third-party libraries used in Android apps, including payment libraries, for security vulnerabilities.

**Questions**

1. Under which topic do they fall?  
2. Which types of third-party libraries do they cover (e.g., generic or focused on a particular type such as payment libraries)?  
3. The technique they use (manual, automatic, machine learning).  
4. Any pre-settings required (e.g., for machine learning, training the model on a labeled dataset).  
5. For scanning-type works, the number and examples of vulnerabilities they consider.  
6. Availability of source code and/or datasets from the paper.

**The Main Cybersecurity Topics I Worked On Were**

1. Linux Usage
2. Introduction to Networks
3. The Dark Web
4. Network Attack Configurations
5. Information Gathering on Networks
6. Network Attacks
7. Post-Connection Activities
8. Introduction to Server & Computer Penetration Testing
9. User Attacks
10. SocialEngineering
11. BeefFramework
12. SocialMediaSecurity
13. BackdoorandTunnelServicesonExternalNetworks
14. Fake Game Attacks on External Networks
15. Setoolkit Usage
16. Post-Hack Procedures
17. Shodan:Webcam, IoT, Service Search Engine
18. Website Information Gathering
19. Website Penetration Testing
20. XSS Attacks
21. SQL Coding
22. SQL Injection Attacs
23. Website Penetration Testing Tools
24. Password/Hash Cracking Techniques
25. Network Theory
26. OSINT(Open Source Intelligence)
27. AI Hacking: Promp Injection

***WEEKLY SCHEDULE***

|  |  |  |  |
| --- | --- | --- | --- |
| Week1 | | First look at the main project file "Automating security analysis of in-app payment libraries in Android APKs" and read Loran's project article. |  |
| Week2 | Detailed review of the project file |  |
| Week3 | Detailed review of the project file | Participation as an observer in thesis defenses of bachelor's degree students |
| Week4 | The process of trying to run Project Codes |  |
| Week5 | Literature Review / Basic cyber security knowledge and infrastructure studies | Participation as an observer in thesis defenses of master's degree students |
| Week6 | Literature Review / Basic cyber security knowledge and infrastructure studies |  |
| Week7 | Literature Review / Basic cyber security knowledge and infrastructure studies |  |
| Week8 | Literature Review / Basic cyber security knowledge and infrastructure studies |  |
| Week9 | Literature Review / Basic cyber security knowledge and infrastructure studies | Sharing the results of the literature review with the supervisor every Friday |
| Week10 | Literature Review / Basic cyber security knowledge and infrastructure studies | Sharing the results of the literature review with the supervisor every Friday |
| Week11 | Literature Review / Basic cyber security knowledge and infrastructure studies | Sharing the results of the literature review with the supervisor every Friday |
| Week12 | Literature Review / Basic cyber security knowledge and infrastructure studies | Sharing the results of the literature review with the supervisor every Friday |

***RECOMMENDATIONS***

I definitely recommend that every student friend who is thinking of an academic career should definitely do an internship at a university. I even believe that my colleagues who are only thinking of doing a master's degree should do a short study at a university at least once. At the same time, I think that universities should provide such internship opportunities to highly motivated and successful students. In this way, students will start their master's and doctoral programs with a clear understanding of whether they really want an academic career. I also definitely recommend that this internship be done abroad because it is very valuable for the student to get to know different cultures, see how things work in the world and bring the new perspectives they gain to their country, both for the student's own personal development and for the development of their country.

***RESULTS***

As a result, when I finished this program, I felt that I had really improved in the field of cybersecurity. At the same time, I had seen very closely what kind of a work life I would have if I chose an academic career path in the field of Information Systems and Computer Science, how to do a literature review and how a project works.In addition, I could speak English much faster and more fluently and express myself compared to the beginning of my internship. I gained many ideas and networks by talking to dozens of people about the sector and even met many engineers in Amsterdam and Groningen. I will never forget the enjoyable conversations I had about computer science with my professors and valuable PhD student friends at lunch...

**giyim, dış mekan, kişi, şahıs, bina içeren bir resim

Açıklama otomatik olarak oluşturuldu**

Figure 7: Memorable moments at the Bernoulliborg Institute

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(For basic cyber security knowledge and infrastructure studies)