Portfolio

Project name (as stated on LIFE website): Gamification of Human Rights Education II

Group name/number: B

Supervisor(s): Karolina Jozefina Aksamitowska

Participants: Filipp-Artur Pljassunov, Jevgenia Saarits, Peppi Isabella Bruns, Ketevan Khutsishvili, Mares Sumarok, Kristin Purga

Project Report

Description of the terms of reference and goals of the project

Main goal of the project was creating “Cyber Crisis” - single player two-dimensional educational choice-based video game in the style of Novel games, using changing texts and background to deliver options and information to the player.

“Cyber Crisis” aims to inform the player on the rules of cyber warfare. Project is non-profit and educational, with only restrictions relating to age, due to the maturity of the topics discussed in the game, which will be 14+.

In “Cyber Crisis” a player is presented with two warring countries. Player represents a government agent of one of these countries responsible for its cyber operations. In each round Player is presented with a scenario and two action options, one of which is legal and the other illegal. The choice made by the player will affect the economic and security parameters of their country. The adversary (NPC) is also making both legal and illegal action through the game that is notified to the player by their advisor (NPC). There are 5 different outcomes to the game depending on the choices made by the player. During the game the player gets information on general rules applicable to cyber warfare, as well as the rules applicable to the specific choices made by them.

The members of the project were divided in 3 teams, based on their educational background and experiences. The Research Team consisted of law students that were in charge of researching laws and rules applicable to cyber warfare and formulating a script based on the research. Team included Peppi Isabella Bruns (Law, Bachelor’s program), Ketevan Khutsishvili (Human Rights in the Digital Society Master’s program) and Kristin Purga (Law, Bachelor’s program). Development team consisting of Filipp-Artur Pljassunov (Computer Science, Bachelor’s program) and Mares Sumarok (Computer Science, Bachelor’s program) worked on the technological research, character design and development of the video game based on the script. Management team consisting of Jevgenia Saarits (Management of Information

Technology Master's program) was involved in the management of the above mentioned tasks and at the later stage in the testing of the game.

The importance of the problem, its description and choice of methods

Cyber Warfare is becoming an increasingly popular topic, in part due to the cyber attacks conducted by Russian in its war against Ukraine. The discussion on the application of laws and regulations to the cyber operations during the war has been ongoing, with ICC chief prosecutor discussing the potential of ICC prosecuting cyber attacks as international crimes[1]. In the absence of binding regulations relating to Cyber Warfare, Tallinn Manual[2], created by the international group of legal and military experts at the invitation of NATO Cooperative Cyber Defence Centre of Excellence represent the most authoritative source on the issue that is widely used by academic scholars and practitioners as it is the most advanced effort up to date in defining the rules applicable to Cyber Warfare based on existing treaties, customary international law (state practice and *opinio juris)* and conventions.

Currently information on Cyber Warfare and related rules are available in the form of academic articles and research. The aim of our project is to make this information available to wider audiences interested in the issue, for whom existing formats may not be attractive, understandable or accessible. It aims to make learning about rules applicable to cyber warfare more engaging and fun.

As the existing educational games on cybersecurity focus mainly on increasing cyber security capabilities of individuals or companies (examples: CyberStart, Spoofy, Uplink, Cyber warrior), "Cyber Crisis" will be the only game that focuses on international law applicable to cyber warfare and increase knowledge and awareness on the legal aspect of the issue, along with potential dangers and remedies related to it.

The design of the game aims to focus the attention of the player on the educational aspect of the game while at the same time maintaining entertaining aspects and was chosen according to the technical capabilities of the members of the team.

Description of activities and reaching the stakeholders

The game will be a useful learning tool for everyone interested in cyber warfare and international law. Primarily, it is aimed at the high school and university student who do not have prior knowledge and experience with international humanitarian law, but would like to acquire basic understanding of the main concepts behind it and its application to Cyber operations during war.

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[1] Karim A. A. Khan, "Technology Will Not Exceed Our Humanity", Digital Front Lines, 2023, https://digitalfrontlines.io/2023/08/20/technology-will-not-exceed-our-humanity/ last accessed 08.10.2023

[2] Tallinn manual on the International law applicable to cyber warfare: prepared by the International Group of Experts at the invitation of the NATO Cooperative Cyber Defence Centre of Excellence, general editor Michael N. Schmitt, Cambridge University Press, 2013

After finishing the testing phase, the team plans to reach out to NATO CCDCOE, to offer them the game as an educational resource that can assist their mission of spreading information about Tallinn Manual. The team will provide the finished game to the law professor of Tallinn University as well as a potentially useful resource for students who are beginning to study international law.

Sustainability of the project

In the development of our cyber warfare computer game, sustainability and cooperation with stakeholders have been integral aspects of our project strategy. To ensure the sustainability of the project, we incorporated several key elements:

1. Long-Term Vision and Planning: We established a clear long-term vision for the game, including post-launch updates and expansions. This not only sustains player interest but also provides ongoing sponsorship streams for continued development.

2. Modular Architecture: Our game design is modular, allowing for easy updates, patches, and expansions. This ensures that the game remains technologically relevant, adaptable to emerging cybersecurity trends and updates/changes in the law, and compliant with evolving hardware and software standards.

3. Environmental Considerations: In line with sustainable development, we prioritized energy efficiency in our game design. By using simple architecture and design, we ensured that playing the game does not require any additional equipment, thus offsetting our carbon footprint through partnerships.

Regarding cooperation with stakeholders:

1. Regular Stakeholder Engagement: We established regular communication channels with stakeholders, including gamers, cybersecurity experts, and industry partners. This ensures that their expectations, concerns, and feedback are consistently addressed.

2. Beta Testing and User Feedback: We engaged stakeholders early in the development process through beta testing, allowing us to incorporate valuable user feedback. This collaborative approach enhances the gaming experience and aligns the game with player preferences.

3. Partnerships with Cybersecurity Organizations: We formed partnerships with cybersecurity organizations to ensure the game's authenticity and accuracy. This collaboration not only enhances the educational value of the game but also fosters a sense of trust among stakeholders.

By intertwining sustainability and stakeholder cooperation into our game development process, we aim to create a lasting and impactful product in the dynamic landscape of cyber warfare gaming.

Summary of the results and annexes

In conclusion, our team is happy with the successful outcome of our project. We invested significant effort to ensure that our story was not only intriguing but also educational. Our workflow was surprisingly smooth and we did not encounter significant obstacles. The development of the game turned out to be the most demanding and challenging aspect, but because of our dedication and continuous engagement we managed to create an enjoyable and captivating game experience.

Looking ahead, we are hopeful that this game will become a valuable resource for schools and professors and that it can be used as a tool to enhance the educational experience, offering a unique and interactive way for students to learn.

Pictures of our finished project:

Menu

Game

About Tallinn Manual

About the Game

General Rules from Tallinn Manual

State Responsibility

Prohibition of the use of force

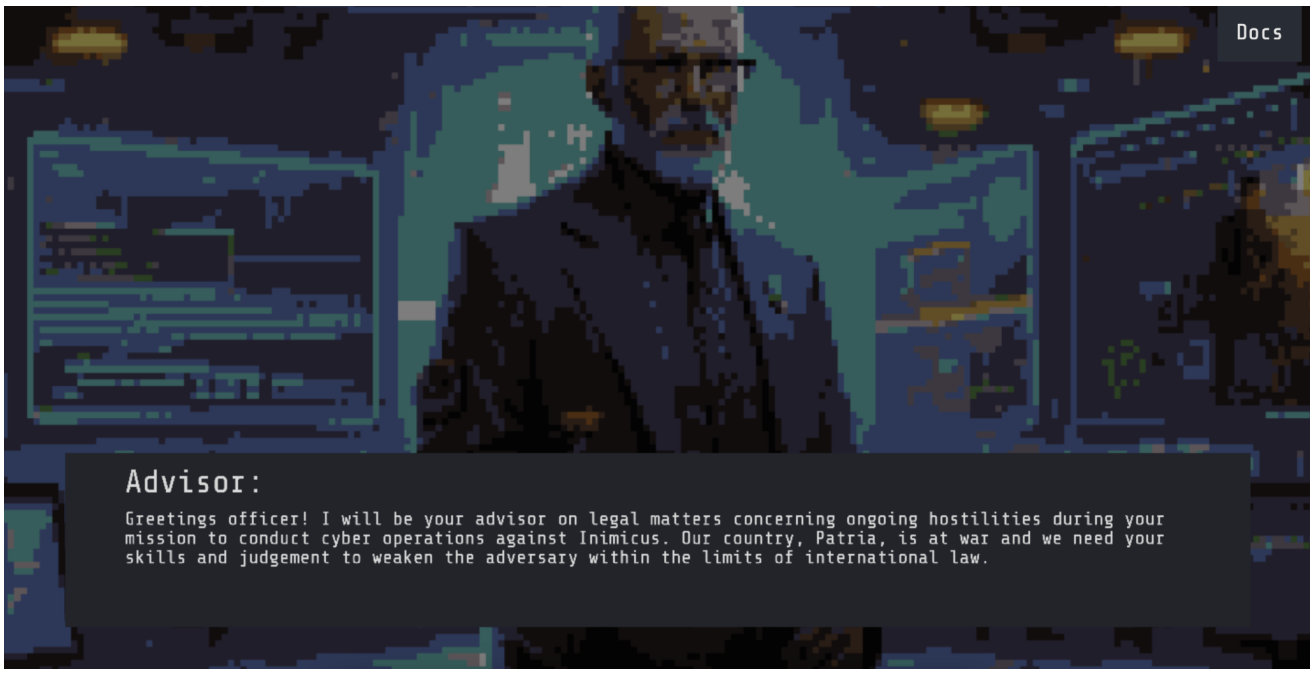
Countermeasures

What is a cyber attack and what constitutes a use of force in cyber operations

Criminal Responsibility of commanders and superiors

About Tallinn Manual

Tallinn Manual on the International Law Applicable to Cyber Warfare was prepared by an international group of legal and military experts at the invitation of NATO Cooperative Cyber Defence Centre of Excellence. The first manual was edited by General Michael N. Schmitt and published by Cambridge University Press in 2013. It was followed by Tallinn Manual 2.0, published in 2017, which covers international law applicable to cyber incidents between states below the threshold of armed conflict. This game is based on the first Tallinn Manual, which concentrates on severe cyber operations, violating the prohibition of the use of force, which can take place during an armed conflict and self-defence. In the absence of binding regulations, Tallinn Manual represents the most authoritative source and the most advanced effort to define the rules of cyber warfare based on existing conventions, treaties and customary international law.



Docs

Advisor:

Our intelligence suggests that Inimicus is using 2 mobile applications (“Orange” and “Purple”) to influence the outcome of the war.

Attack "Purple"

"Purple" is used to spread propaganda among our population. We have the ability to conduct Distributed Denial of Service (DDoS) attacks against one of the applications.

Attack "Orange"

"Orange" is used to communicate with resistance forces in Patria, passing coded messages on military plans and targets.

Docs

Feedback on 'Attack “Orange”'(legal):

According to Rule 38 “Orange” can qualify as a military objective as it is making an effective contribution to military action. Disabling “Orange” and with it communication between the adversary and forces aligned with them can offer us a definite military advantage. Thus, this action does not go against the rules.

Your stats

Project Action Plan

Activity and short description	Timeframe (which month)	Person (name + study field) or team responsible
Extracting basic rules from Tallinn Manual - researching first Tallinn Manual and other relevant legal documents and scholarly articles on the application of International Humanitarian Law to cyber operations during the war	September-October	Research Team
Choosing rules from Tallinn Manual to base gameplay on - selecting number of rules from the first Tallinn Manual that will be used to base the game scenario on	October	Research Team
Formulation action options for the player based on chosen rules - Basing scenario on the selected rules and creating a hypothetical action and two choices for action (legal and illegal) for the player	October	Research Team
Formulating explanations following the actions based on Tallinn Manual rules - explaining, based on the Tallinn Manual and other relevant texts why the action	October	Research Team

chosen by the player was legal or illegal		
Technology research - choosing a platform to create a web-based game	September-October	Development Team
Learning new technologies	October-November	Development Team
Skeleton script for the game - creating the first draft of the game script	October-November	Research Team
Visual design - creating a general visual design for a game prototype	October	Development Team
Assets creation - AI generated images based on needed prompts were pixelated following common design patterns.	October-November	Development Team
Low-fidelity prototype - creating a basic game prototype and logic using Figma	October-November	Development Team
High-fidelity prototype - migrated low-fidelity prototype from figma to our game engine of choice. Used	November	Development Team

all the effort we had to make it responsive and interactive.		
Version 1.0 - The first publicly available version was published by the end of november. Since it has all the aspects that we wanted we consider it as a finished mini-project and not as a prototype. Visions 1+ could feature more questions and extra challenges.	November-December	Development team
Finalizing the script - creating the final draft of the game script	November	Research Team
Integrating the script in game - we have split the text into different parts corresponding to their role in the game context.	November	Development Team
Testing - at first we used manual and auto testing during the development process. After that we have shown the prototype to the dedicated users and made some needed bug fixes and adjustments. Also there the test-session using the control group	November-December	Management Team

should be held some time in the future for wider feedback.		

Communication to stakeholders

So far the team has acquired assistance from several law professors specializing in international law and cyber warfare at Tallinn University in overviewing the script of the game and giving notes on the legal aspects and terminology to make the game as accurate as possible. After completing the testing phase, the finished game will be provided to them and other law professors at the university to use as an educational resource for students studying international law, specifically international humanitarian law and law applicable to cyber warfare. At that stage it is also planned to reach out to NATO CCDCOE, to offer them the game as an educational resource that can assist their mission of spreading information about Tallinn Manual.

Self-reflection reports

Self-reflection report about the learning experience of each team member - learning experience of each individual student (up to 150 words) to describe the experience gained during the project and evaluate the achievement of project goals

Filipp-Artur Pljassunov

As a participant in the project, my main responsibility was the development of a documentation section for the game, but I also participated in game design and prototype creation. Due to the lack of designers on the team we had to design the game from scratch, but we managed to do it, which gave me knowledge about game development and design. I was only playing games before, but now I had the opportunity to participate in the development of the game. I was really surprised with our teamwork and how productive it was, thanks to the regular meetings, constant exchange of opinions, activity, and interest of all team members. Each team member had their own role and did their work on the topic they were competent at. Thanks to the collaboration in the group, we were able to achieve the result and finish the project on time without any problems.

Jevgenia Saarits

Throughout the project, I've undergone a profound learning experience that has significantly shaped my professional and personal growth. Initially grappling with unfamiliar technologies, I

developed a resilient problem-solving mindset and acquired a comprehensive understanding of intricate project components. Even though I like to play computer games, I have never seen the development process of one. Also, I do not think I would come across Cyber warfare laws in my everyday work, so it was a very good widening of knowledge. I was very surprised with smooth communication skills between teammates and even when disagreements arose, we all communicated through them and resolved very quickly. All of the team members contributed to the project to the fullest extent, which helped us to achieve our goal in time frames.
This experience has not only deepened my technical expertise but also instilled in me a sense of adaptability crucial for navigating future projects. Overall, the journey has been instrumental in shaping a more resilient and skilled professional.

Peppi Isabella Bruns

My role in the project was that of a researcher. I found the topic of cyber warfare to be interesting as it was a relatively new topic for me. While working on this research, I simultaneously had an International Humanitarian Law course which I found to be useful. Both the course and the LIFE project complemented each other and helped me better understand the rules of wartime. I have to say that I have been pleasantly surprised by how smoothly everything has gone in our group, with everyone putting in the work and playing their part in producing a video game, which is not an easy task and which requires a lot of time and effort. While our plans may have seemed ambitious, they proved to be realistic as everyone adhered to the schedule and collaborated effectively. I found our group dynamic to be good and I think that we all learned a lot in the process.

Ketevan Khutsishvili

During the project I focused on researching the source of the game, the first Tallinn Manual. During my studies I did not have a chance to explore the Manual closely and this presented a great chance to do so and expand my knowledge on the application of International Humanitarian Law to Cyber conflicts. At first it was difficult to base a game scenario on the legal formulations in a way that would not leave any questions or disagreements with the interpretation of laws and rules and their application to the scenarios that we came up with, while at the same time maintaining realistic, engaging and interesting gameplay. Fortunately, due to the excellent engagement of every member of the team, we were able to create a game both legally sound, educational and fun to play.

Mares Sumarok

I found the overall experience to be positive and engaging. The team's dynamism and active participation created a collaborative environment that fueled the project's development process and that the project was eventually finished(rare for school IT projects). Role distribution and the autonomy granted in organizing responsibilities added a sense of ownership. However, a notable aspect for improvement lies in the team composition. While the team was generally well-selected, the absence of a dedicated designer and the presence of three researchers created an imbalance. A more even distribution of roles could have enhanced the project's

design aspect. Although it was not a big deal in our case due to our main focus being the manual analysis and learning aspects of the project, not the game elements or design.
Overall I consider it as the best project experience that I had in my university time.

Kristin Purga

I took the role of a researcher since having taken an International Human Rights course before, I found that I would be well-suited for that role. My primary responsibility was to research the Tallinn Manual and extract the relevant rules that would serve as the foundation of our script. I also assisted in the development of the story and making a script for the game. This project was a fun challenge that I think me and my teammates managed really well. I think that our time management and consistency with having regular meetings and productivity during meetings is what helped us stay on track. I have not done team projects of this level so far in my studies so I was really glad to meet such talented people and learn to collaborate with others a bit more. I am also really happy with our collaboration and teamwork, and really proud of how the final game turned out.