Ph.D. Theme Proposal

Bring History to Life – Digital Footprint of the Roman Colosseum

Scientific Field: Archaeology/Digital Archaeology

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Table of Contents

Sources, Keywords, Notices

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Keywords

Digital, Modelling, Rome, Roman, Applications, Unity, Blender, 3D, Projects, DH

Notices

Some parts of this text are created according to European Commission rules – MSCA (Marie Sklodowska Curie Actions) program.

Inspiration for title of my PhD Theme Proposal, I have found on "Viasat History" channel – "Bring History to Life".

Quality, Innovative Aspects and Credibility of the Research Programme

Introduction

For many tourists around the world, visiting the Roman Colosseum is a "must" requirement in their tours when come to Rome. Many of them have a professional guide to introduce about this monument, and some people like to explore about this colossus on their own. However, people in their visit to this magnificent archaeological monument, have a possibility to see ruins of this place, but it's hard for them to imagine how these ruins looked in the past. On the other hand, in previous centuries, people who liked archaeology and ancient history probably wanted to know more about these gigantic structures, to find out more about how this scenery looked in time of Ancient Rome, but there wasn't any possibility, except in some books (drawings), to find more about how it will be to bring history of Roman Colosseum to life.

Today, we are lucky enough, that computer science shapes our reality and world. From social connections to the practical use in many areas of life, we use computers to make better our daily activities. On the other hand, thanks to the computer technology, scientific community has an excellent support for research and further development, where archaeology isn't an exception. Today, we have many digital tools, which are all about support for archaeological exploration missions, but also for educational purposes. Additionally, that's a reason why people, with no background in archaeology have an opportunity to be involved in research about archaeological missions around the world.

When we talk about Roman archaeology, digital tools have a potential to help in many different ways (people have a possibility to expand their knowledge about ancient Rome, to meet the Colosseum, Roman Forum and beyond). Additional, these tools give to young people possibility to develop interest for history and archaeology, and to open up new horizons in their view on scientific world.

To support further development of digital infrastructure in archaeology, we need new applications, new fresh ideas in archaeological science which have a capability to bring us to the next generation of educational and exploration tools, with focus on young generations.

I am aware that there already exist digital tools about Roman archaeology, but I believe that we need to move further, to expand our digital infrastructure in archaeological science. That's one between many reasons, why I have an intention to work on PhD research, with purpose to contribute to the further development of digital infrastructure of the Roman archaeology and history. Focus of my PhD theme is to create modern educational/exploration tool, which relates to Roman Colosseum, where I am going to use digital tools and apps, modelling tools (Blender and 3DS Max), but also and game engines (Unity, Unreal).

On the other hand, theoretical approach to the history and archaeology of the Colosseum will be very important part of my work and I will use that as background for digital approach. Quality preparation is a key for the success of the doctoral research, and preparation is all about appropriate literature. In my home library, I have a lot of papers and books, which relates to Roman archaeology and history, from research about history of the Colosseum (The Colosseum as an Enduring Icon of Rome) to the Roman history (The Roman Empire – Rise and Fall).

Digital approach to exploration about Colosseum is still in the cradle, and there are few quality applications, which could be a support for research and education. It is worth to be mentioned Colosseum VR Project, which is created by Unimersiv studio[1] [2]. However, this application is only the beginning – there are many gaps, which need to be filled (there is no timeline, no explanation about roman amphitheatres in general, there are basic characters and interaction with these is very rudimentary (talking with the people, for example)).

Colosseum, as it is seen in current version of my educational/exploration tool.

My vision, which I want to bring to the light in this PhD journey is to create digital exploration tool, which is all about Roman Colosseum, its history, structures, but also about surrounding objects. However, this application can't be completed without rudimentary data about amphitheatres of the Roman Empire, so there will be basic information about these structures.

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[1] https://unimersiv.com/
[2] https://unimersiv.com/review/colosseum-vr/

Objectives

Objectives for this work need to be structured to provide a possibility to be created quality dissertation. Also, because of better understanding of my work, and to present about work structure I will give short introduction about objectives for this scientific work.

Objective 1:

Important History Moments in Development of Roman Colosseum

History is always important in any research paper. Through historical approach it is possible to reveal about construction, early days and later development of Colosseum.

Work on this objective need to give answers on several important questions:

- Development of Colosseum area through time (from Flavian Dynasty to the end of the Roman Empire),

- Problems, challenges, obstacles related to construction works on Colosseum and how workers and engineers handled it,

- Colosseum after Romans.

Objective 2

Archaeological Research in Colosseum Area

In the first half of the XIX century, was taken the earliest modern scientific investigation in the Colosseum area. Mr. Tom Mueller wrote in Smithsonian magazine: *"By the early 19th century, the hypogeum's floor lay buried under some 40 feet of earth, and all memory of its function — or even its existence — had been obliterated. In 1813 and 1874, archaeological excavations attempting to reach it were stymied by flooding groundwater. Finally, under Benito Mussolini's glorification of Classical Rome in the 1930s, workers cleared the hypogeum of earth for good.* "[3]

Related to archaeological research, there are following questions:

- Medieval Catholic Church, first medieval interest for Colosseum?

- Early archaeology research in Colosseum, methods and instruments?

- Archaeological research in XIX century?

- Modern tools in archaeology and exploration in Colosseum?

Objective 3

UI/UX Development

To enjoy in work with any digital application, maybe the most important element is a quality UI/UX approach. The fact is that we like to see quality designed and functional user interface. In Decode Colosseum, I care about UI/UX, in first place because of comfortable use of my application.

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[3] Tom Mueller, Smithsonian magazine, January 2011

Excellent text about importance of the quality UI/UX design for modern educational tools, can be found on Backpack Interactive website:

„When it comes to designing UX in education, a generalist approach to product design and user experience simply doesn't cut it.

Learning products have very different requirements than consumer tech. They're used by teachers and students in school environments to achieve high-stakes outcomes.

That's why it's even more important to base the UX of learning tools on research that reflects how students learn most effectively. By specializing in learning science, product design, and user research, UX designers in education are poised to become the learning engineers of the future."[4]

There are many subobjectives, which need to be answered, but the most important are:

- Customize application (graphics, sound, etc.),

- Educational UI (texts, information).

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[4] https://backpackinteractive.com/insights/ux-education-learning-engineers/
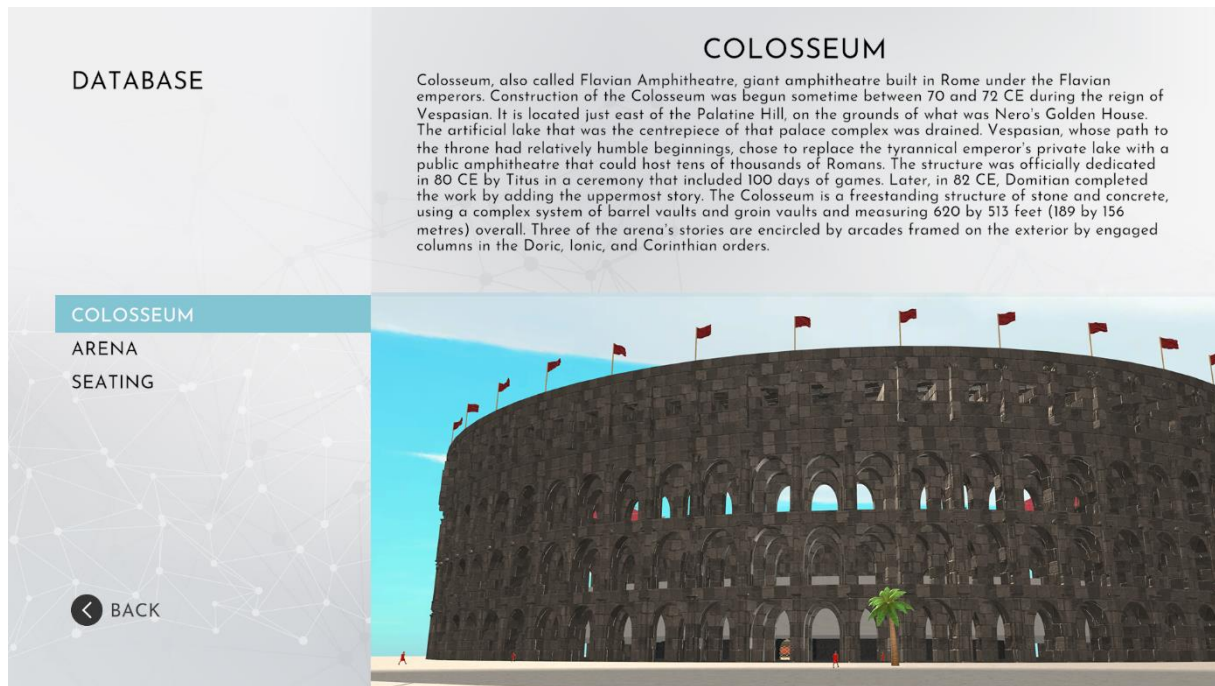
UI in upcoming version of my Decode Colosseum app

Objective 4

Work on the Structures – From Underground to the Ludus Magnus

The most complex element in my work is development of different structures in, and around Colosseum. It all starts with terrain creation, and continue with underground area, terrain, ground floor and beyond. To achieve these results, I am using two main tools – Unity Game Engine and 3DS Max. However, to improve my work, I additional use – Unreal Game Engine and Blender. To complete this objective I have to fulfill two main subobjectives:

- Historical/archaeological background about development of Colosseum,

- Apply proper 3D models, textures and other digital assets,

- Programming elements in C# language.

Objective 5:

Comparative Approach

Because I am working on my own projects, which relates to digital archaeology of Ancient Rome and Egypt, in this paper I will use comparative approach in Egyptian digital archaeology. Ancient Egypt has several important projects related to digital archaeology. It is worth to be mentioned Giza3D Project, which is created in partnership of Boston's Museum of Fine Arts and Harvard University[5] [6]. It's a very quality project, with innovative approach to long history of Giza Plateau.

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[5] *https://www.youtube.com/watch?V=xnssjcg4acu*
[6] *https://www.3ds.com/stories/giza-3d/*

Research Methods

I have decided to use following research methods with purpose to achieve good results and to reveal some very useful findings in this exploration mission:

Research from Historical Point of View

History of Roman Colosseum is long and from this method could be revealed many important findings for this research, from the underground, Ludus Magnus, arena to the Colosseum as whole.[7] These are just a small part of the objects in and around Colosseum.

Research from Archaeological Point of View

History of Roman Colosseum is extremely long and from this method can be revealed really many important facts and findings for this research. From the construction of the Colosseum, to the fighters in arena, from the gladiatorial games to the naval battles. These are just a small part of the events, which relates to the Colosseum. Historical method will reveal more about Colosseum builders, conditions, about underground area and many other artefacts in the Colosseum.

Testing of digital apps and tools,

This method is important because, testing of digital apps and tools could provide crucial information about features, possibilities, limits, pros and

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[7] *https://www.ancient.eu/giza/*

cons of these programs. I will need to test and present results about features, functions, options and development of Unity Game Engine, Unreal Game Engine, 3DS Max and Blender.

Interviews with high profiled experts in this field,

Today, but in the past too, interview is one of the most important tool for researcher. There are several important principles related to interview (I will insert here just some of them):

„Neutrality",

„Generation of new knowledge",

„Ethics".[8]

- *„Neutrality"* is maybe one of the most important principle for good scientific research, because researcher need to take a neutral stand in interview.

- „Generation of New Knowledge" – „...Thinking about an issue in a new way."[9]

- *„Ethics"* – Interviewer need to follow ethics standards.

Comparative approach (Digital Environments – Ancient Rome and Egypt)

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[8] http://www.emeraldgrouppublishing.com/research/guides/methods/interviews.htm
[9] http://www.emeraldgrouppublishing.com/research/guides/methods/interviews.htm

Comparative approach is old good method for scientific research. There are two excellent sentences to reveal more about this approach:

„Comparative research methods have long been used in cross – cultural studies to identify, analyse and explain similarities and differences across societies.

The benefits to be gained from cross – national work include a deeper understanding of other cultures and of their research processes."[10]

On the other hand, comparative approach, which relates to digital environments of Ancient Egypt and Rome, could provide excellent insight about development of digital reality worlds, which relates to these ancient countries.

Internet Research

In modern time, any scientific research need internet sources for creating a good research paper. There are many places on internet where could be found literature. As first Google Books is an excellent place for researching on different scientific themes. Also, there is a Google's Public Domain library.

On the other hand, there are quality scientific driven webpages (for example academia.edu, ResearchGate), where scholar could collect important material for his/her research.

Literature (books)

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[10] *http://sru.soc.surrey.ac.uk/SRU13.html*

There are many books written about Roman Colosseum. I already have some important literature in my home referring to Ancient Rome and Colosseum. Also, Google has a collection of public domain books.

Research Visits

For successful research I need to visit several places with purpose to create better doctoral paper. My research visits need to provide useful facts in following areas:

HISTORY/ARCHAEOLOGY

Italy, Rome, The American Institute for Roman Culture

The American Institute for Roman Culture is one of the largest in Italy. Institute's work is to „preserve and protect Rome's extraordinary cultural legacy". From Institute's website, we can read:

"The American Institute for Roman Culture works tirelessly to preserve and protect Rome's extraordinary and unique cultural legacy through education, outreach, and action."[11]

Large number of scientific material and excellent organisation give recommendation to visit this Institute, talk with the experts about my PhD work and acquire new founds.

Italy, Rome, Colosseum

Visit to Roman Colosseum will be crucial for historical/archaeological, but also for digital approach. From historical perspective, I will have a possibility to find out more about details of historical development of Colosseum. On the other hand, it will be an excellent opportunity to get

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[11] *https://romanculture.org/about/*

quality plans of the Colosseum in the past, but also to make photos of the Colosseum today, to easier create virtual environment. Finally, very important part of this visit will be visit to the „Colosseum Museum".[12]

DIGITAL APPROACH

Austria, Graz, Austrian Centre for Digital Humanities

To learn more about concept of digital humanities (visit to Graz, Austrian Centre for Digital Humanities). This visit is very valuable because of possibility to I learn more, talk with experts about digital humanities system and to apply some concepts to my work. I want to mention here, that I had some contacts with appropriate scientist/professor in this institution.

Austria, Vienna, Institute for Oriental and European Archaeology, Digital Documentation Lab

Digital Lab (visit to OREA – Institute for Oriental and European Archaeology (Vienna), Digital Documentation Lab). Visit to this Lab could provide connections with crucial people and experts in digital archaeology field. Institute orientation to Europe, Egypt, Levant, Aegean and Anatolia[13] regions give strong recommendation for visit to this Institute,

Ubisoft Offices, Belgrade, Serbia

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[12] https://parcocolosseo.it/en/area/museums/the-museum-of-the-colosseum/
[13] https://www.orea.oeaw.ac.at/en/home/

Because Ubisoft software company is one of the largest gaming industry, but also their game Assasins Creed serial has excellent ancient locations, it will be very important to find out more about creation of different digital worlds, but also their experience in process of the creation itself. For example, in Assasins Creed Origins, along with gameplay, there is also and Discovery Mode.[14]
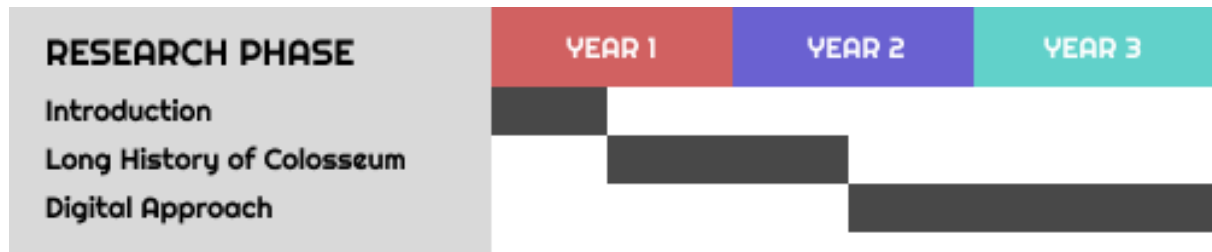
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[14] *https://www.youtube.com/watch?v=l_KOpq_BH1g*

Quality and Efficiency of the Implementation

Milestones list

- Introduction

- Colosseum's History

- Digital Approach

*W*ork Chart

RESEARCH PHASE	YEAR 1	YEAR 2	YEAR 3
Introduction			
Long History of Colosseum			
Digital Approach			

ETHICS

Intellectual Property Rights

All intellectual rights in this work will be protected. As first, any citation will be provided in footnote with appropriate data about author, book, publisher, etc. I will make a commitment to copyright protection related to digital products too. Any photo under licence will be treated according to licence. My work will be accessible for checking („Intellectual Property Rights").

Legal and Ethical Elements

My work will be in line with legal documents related to ethical elements. Also, I will follow moral rules in this work.

Date: 05/07/2023