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Identification of unstable carotid plaques associated with symptoms using ultrasonic image analysis and plaque motion analysis

AtheroRisk stroke risk prediction

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Deliverable

D.2.2 Progress Dissemination Report V1

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Executive Summary

In this document, the dissemination and outreach activities that took place during the AtheroRisk Project's first year are being described.
All activities that were realized in order to communicate and engage with relevant stakeholders, and health professionals, and notify them about the outcomes of the AtheroRisk project are being presented. Future planned activities are also described.

Acronyms

Acronym	Definition
CUS	Carotid Ultrasound
CUT	Cyprus University of Technology
CYENS	Cyprus Centre of Excellence
DL	Deep Learning
HO	Host Organization
WP	Work Package

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1. Introduction

According to the dissemination and outreach activities, as proposed and explained in the 'D.2.1_Dissemination_Outreach_Activities_Plan', in the current document we describe the progress that was made towards all dissemination directions and channels, during the first year of the AtheroRisk Project.

Overall, the Cyprus University of Technology (CUT) and the Cyprus Centre of Excellence (CYENS) participate and have been in charge for the Work Package 2 (Dissemination and Outreach Activities) following tasks:

- Task 2.1: Dissemination and Outreach Activities Plan (CYENS),
- Task 2.2: Communication and public engagement strategy, means, and tools (CUT),
- Task 2.3: Design and development of dissemination and outreach activities and content (CYENS),
- Task 2.4: Targeted dissemination events (CUT).

2. Dissemination Channels

The CUT in collaboration with CYENS have designed a plan to reliably disseminate information about AtheroRisk Project's activities, as well as all corresponding results (see also 'D.2.1_Dissemination_Outreach_Activities_Plan').

2.1 Dedicated Webpage

As part of Task 2.2, the 'ehealthlab@CUT' team, representing the AtheroRisk CUT partner, has developed and currently maintains a dedicated webpage for all AtheroRisk's produced content and information, which is hosted in the laboratory's official website (click here to visit the project's webpage, and here to see a post). On this webpage, the team intends to present all public deliverables and inform the AtheroRisk's target groups (healthcare professionals, doctors, stakeholders and colleagues) about all events and results concerning the project.

2.2 Social Media

In addition, as part of Task 2.2, the 'ehealthlab@CUT' team, representing the AtheroRisk CUT partner, also maintains a Facebook page for the laboratory, where all relevant information about the AtheroRisk Project is uploaded (click here to visit a relevant post).

2.3 Newsletters

Regarding Task 2.3, the CYENS has distributed a primary newsletter, during the first year of the AtheroRisk, to notify all target groups (healthcare professionals, doctors, stakeholders and institutes), mainly in Cyprus, about the initialization of the project, giving a brief description of the AtheroRisk's objectives. CYENS also hosts an informative webpage for AtheroRisk (click here to visit the webpage).

2.4 Conferences

Following the proposed actions in Task 2.4, in 2022, the 'ehealthlab@CUT' team members involved in AtheroRisk, participated in 2 Conferences, which took place in Greece, to present the primary results towards the development of the proposed integrated system for the identification of

unstable carotid plaques associated with symptoms using ultrasonic image analysis and plaque motion analysis. More details are given, below:

- *18th International Conference on Artificial Intelligence Applications and Innovations (AIAI2022)*. In June 2022, a young 'ehealthlab@CUT' researcher submitted and virtually presented a four-page paper, in the 18th International AIAI2022 Conference (held in Crete). That study was named 'Deep learning-based segmentation of the atherosclerotic carotid plaque in ultrasonic images' [1], where a primary deep learning-based (DL) workflow was proposed and evaluated to automatically annotate plaques in carotid ultrasound (CUS) images, with minor effort by the user, but with reliable segmentation accuracy.

- *IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI'22)*. In September 2022, the AtheroRisk Host Organization (HO) participated in the IEEE-EMBS International BHI2022 Conference, in Ioannina city (Greece), with a one-page paper, which was presented under the 'Atherosclerotic Cardiovascular Disease Risk Assessment' Special Session (click here to visit the official BHI2022 relevant webpage, and here to see a relevant post on '*ehealthlab@CUT*'). The paper was named 'Identification of unstable carotid plaques associated with symptoms using ultrasonic plaque image and motion analysis – AtheroRisk', while the Special Session was co-organized by the group of the HO and co-chaired from the AtheroRisk Project's Principal Investigator. The project's launch was announced during this presentation, along with the Consortium, and details regarding the purpose and objectives were provided. Importantly, existing CUS video analysis solutions from the Consortium members' prior research were displayed, serving as the initial building block of the new AtheroRisk software.

- *24th International Conference on Digital Signal Processing* (DSP2023). In June 2023, an additional dissemination activity will take place in Rhodes (Greece), where we aim to present the results of the project. We have already submitted our recent study, where the primary AtheroRisk Software module (presented in AIAI2022) for automated atherosclerotic plaque segmentation in CUS images and videos has been further standardized and upgraded, resulting in high and reliable accuracies.

- *20th International Conference on Computer Analysis of Images and Patterns* (CAIP2023). This conference will be co-organized by CUT. There we will present the first version of the AtheroRisk Software and we will develop a Workshop ('AtheroRisk Version 1 – Workshop'), in order to allow our target groups (mainly healthcare professionals and doctors) to interact with the Software and provide suggestions through a questionnaire, we will distribute.

2.5 Prestigious scientific journals

Additionally, a Journal publication on the 'Automated Segmentation of Carotid Plaques Using Deep Learning techniques' is currently under final in-group revisions, and will soon be submitted to the Journal of "Computer Methods and Programs in Biomedicine", (CMPB Springer).

References

[1] G. D. Liapi, E. Kyriacou, C. P. Loizou, A. S. Panayides, et al., "Deep learning-based segmentation of the atherosclerotic carotid plaque in ultrasonic images," in Artificial Intelligence Applications and Innovations. AIAI 2022 IFIP WG 12.5 International Workshops, vol. 652, I. Maglogiannis, L. Iliadis, J. Macintyre, and P. Cortez, Eds. Cham: Springer International Publishing, pp. 187–198, 2022