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CYTEST - A NEW PLATFORM FOR TRAINING AND TESTING IN CYTOPATHOLOGY

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Introduction/ Background

Clinical training at the European level requires flexible ways to provide education across borders with the goal of a unified way to teach and assess quality. The CyTest project focuses on Cytological Training at European Standard through Telepathology. The project (2014-1-IT01-KA202-002607) has been approved and funded in 2014 by EU within the ERASMUS+ Program. The project consortium is composed of 4 leading university Institutions (COREP and University of Turin, University of Padua, Imperial College of London, IPATIMUP/University of Porto and University of Graz) with technological development and support provided by CRS4. In addition, it benefits from the collaboration of International Organizations (EFCS, Eurocytology, OME) and is open to contributions from additional groups and Societies.

Aims

Our aim was the establishment of a platform for the sharing of digital pathology images and of an auxiliary system that will use the latter platform for the distribution of cytologist training courses with an integrated virtual microscopy capability.

Methods

The CyTest platform is based on the integration between Moodle, an e-learning platform designed to create personalized learning environments, and OME OMERO, a well known open source software for visualization, management and analysis of biological microscope images. The former is used to provide access to a database of questions produced by specialized trainers and the latter provides access to digital pathology images and related metadata. We chose to base our infrastructure upon Moodle because it is one of the top leading platform for online education with a large community of users across both academic and enterprise level, highly customizable and modular. OMERO was chosen because of its compatibility with a large number of image formats for digital pathology images, its handling of image metadata (i.e., TAGs and Regions of Interest) and its easily extensible web platform.

Results

The web platform can be used with a wide range of devices, it is compatible with most of the image formats produced by digital slides scanners and it can scale to a wide student body. Teachers can create courses, populate the Question Bank and aggregate questions in quizzes, while students can take classes and tests. When creating questions, teachers can choose images previously loaded and annotated. We provide two new types of questions: multiple choice, focused on an image and its ROIs, and interactive, where students identify areas on the image by markers that will be automatically compared to instructor's specified ROIs. The currently deployed system holds already a set of several hundreds of images classified by categories (e.g., tissue type and diseases) with associated ROIs identified by pathologists. The CyTest platform provides a full technological solution for a more homogeneous training and testing of cytotechnicians and cytopathologists with uniform quality level assurance mechanism. The system could be easily extended to support the teaching of histopathological diagnosis. Moreover, the CyTest platform paves the way to an e-QUATE test, thus providing

an efficient and economical way to replicate the test at European scale. The sustainability of the platform and the supported educational material (images, questions and evaluation algorithms) will be guaranteed by its integration in EFCS activities. We expect to distribute the CyTest System for validation by October 2016, for further information contact infocytest@corep.it.