A WHO Pilot Project for Global Digital Consultation Based on Bluebook Cancer Atlases

Designing, Developing and Validating an AI-Driven Image Search Engine for Breast Cancer Subtypes to provide Computational Second Opinions through Biopsy Matching

Project summary: This project will design and validate software using Artificial Intelligence (AI) to process medical images to create a medical image search engine. Whole slide images are digitized biopsy samples and quite large files usually called gigapixel images. Their acquisition, processing, and analysis are major tasks in digital pathology. As well, we need to develop an algorithm to also accept and process microscopic snapshots since not all pathologists may have access to digital scanners.

Justification

The target of this research proposal is to develop and validate a medical image search engine using the WHO Classification of Tumours to assist in the diagnosis of breast cancer subtypes, enabling appropriate therapy. This medical image search engine will be particularly beneficial to populations without access to expensive high-end technologies. As well, it will be useful for developing countries when rare breast subtypes are encountered.

Goal

Motivated by the recent success of AI, and with emphasis on unsupervised learning (i.e., search), we would like to contribute to the improvement of breast cancer diagnosis globally, not only just for rare cases, but also for common cases where ordinary pathology competency may not be available, e.g., in remote locations and in developing countries.

Target audience

Pathologists, Oncologists, Epidemiologist, and any other researchers, stakeholder or actor in the field.

This project is being developed by KIMIA Lab, University of Waterloo's under the leadership of Dr Hamid Tizhoosh and in collaboration with IARC.

IC3R | collaboration for cancer classification