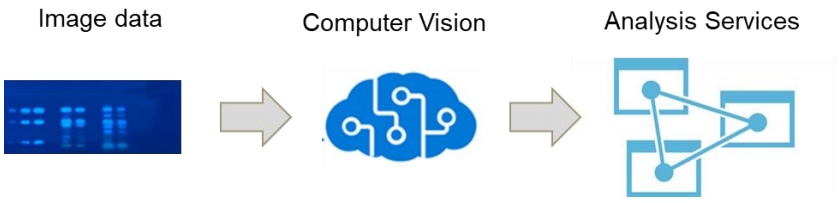
Master's Thesis

MSLS: Applied Computational Life Sciences

Zurich University of Applied Sciences
zh aw Life Sciences and Facility Management
Institute of Applied Simulation

Title of project / Master's thesis	Effect-based Trace Analytics of Toxic Substances leveraging Native Cloud Computing Services (Cognitive Services, AI and ML)
Track	➢ Special track
Topic / Key words	effect-based trace analytics; toxicity, bioautography; computer vision; AI; ML; cloud computing
Supervisor	Andreas Schönborn, ZHAW / IUNR
Co-Supervisor	Stephan Schilling, Planar4
External partners	Planar4 GmbH, a ZHAW Startup
Place(s) of work	Any place with periodic touchpoints at ZHAW Campus
Abstract	Combining latest evolutions on bioautography and computer science shall help improving the detection of microcontaminants in the environment and in food! The target of this project is to analyze images and additional data taken from bioautography processes with the help of cloud powered AI and ML services. Target is to detect known patterns with accuracy and be able to grow the detection capabilities with more data becoming available. Suitable logic would need to be added to perform in- and output validation and context normalization calculations considering estradiol-equivalent-concentration (EEQ-Values) with possible process-variations (i.e. saturation-factor, extraction volumes,…) Native Cloud Computing Services shall be applied to leverage standard services and be able to focus on detection and analytics logic i.e. by leveraging: ⇨ computer vision AI services to engineer suitable content discovery patterns on the "planar-analytics" images ⇨ ML powered analytic services to process detected patterns and generate accurate report. 
Requirements	What competences are required from the student? ⇨ Interest (or prior experience) in cloud computing / Azure (preferred) or AWS; generic programming skills required (.Net, Java, Python) and interest to identify and integrate native cloud services with custom code (via API / SDKs) ⇨ Toxicological and bioautography experience is not a "must", understanding can be acquired within the project. ⇨ Generic interest in environmental and human health topics is assumed ⇨ Master student can work from any place and any computer, with regular checkpoints with supervisors required.

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Comments	Our goal is to improve our environment and health by applying state-of-the-art technology on bioautography and computer science! Be part of an exciting mission and learn how to apply your knowledge to improve our societal capabilities!
Date of document	03.07.2020
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