Fachhochschule Nordwestschweiz
Hochschule für Life Sciences

Characterization of Cells for In-Vitro Fertilization

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Bachelor-Thesis, Studienrichtung Medizininformatik

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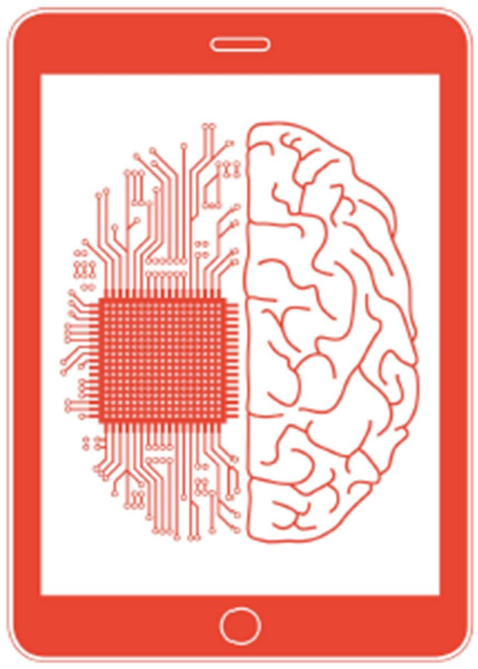
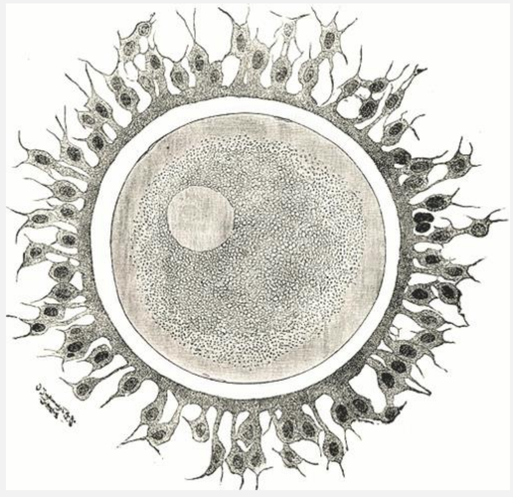
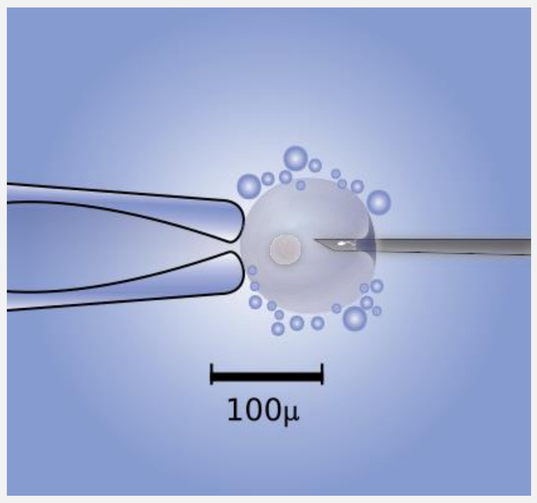


Oocyte

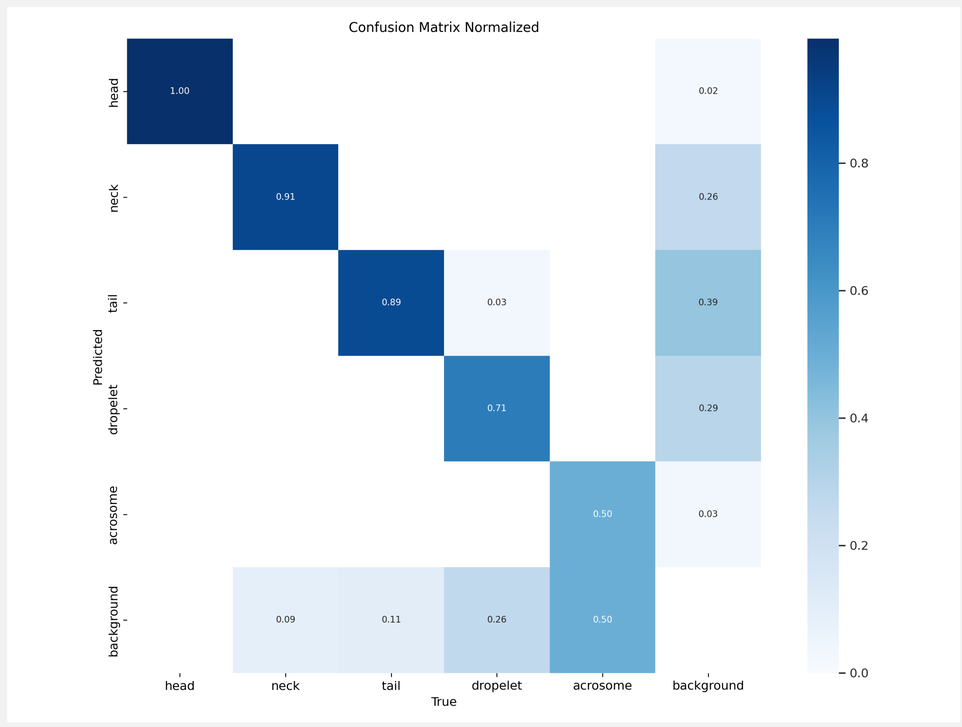


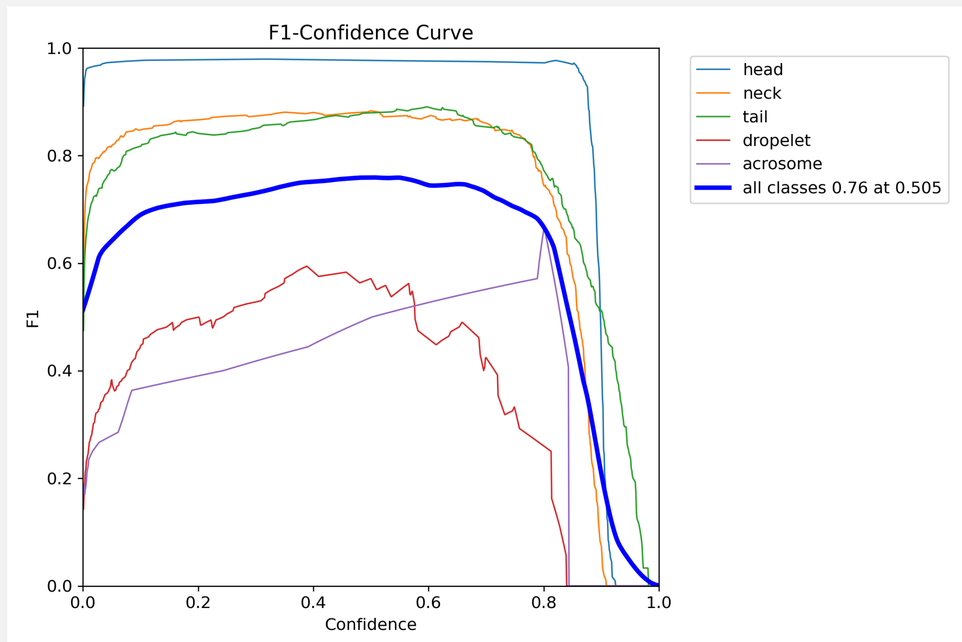
Intracytoplasmic sperm injection



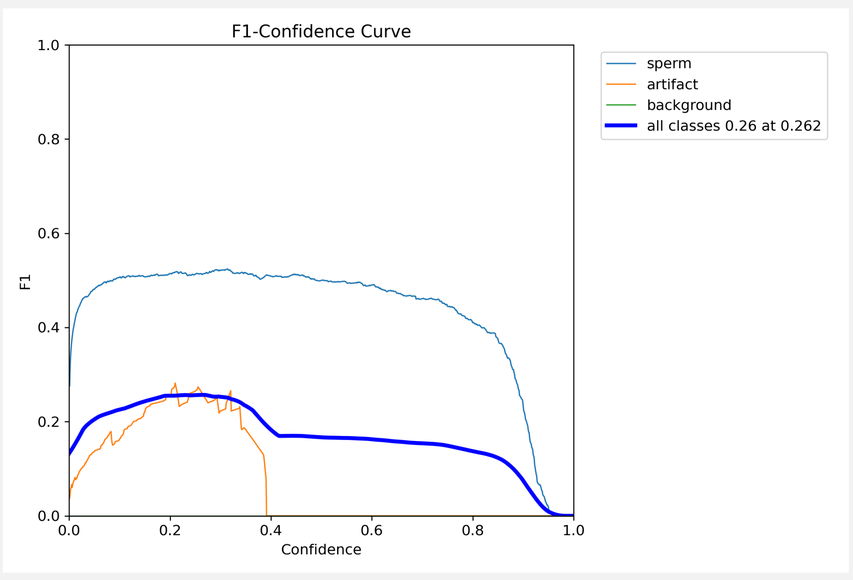
In-Vitro Fertilization and intracytoplasmic sperm injection can be enhanced by choosing sperms with normal morphological shapes and progressive motility. As artificial intelligence technology advances, it appears that assessments of important sperm cell factors are rational. The goal of this project is to develop an application that can perform a grading of individual spermatozoa based on video material of optical microscopy. As the starting point of every machine learning project, there is data. The project involves the development of different approaches for using the data to yield useful information and achieve a pipeline of machine learning and image processing algorithms. The scope of the project is beyond the scope of this thesis. The current state of the application is unable to handle the entire process of grading, but most of its capabilities are in place.

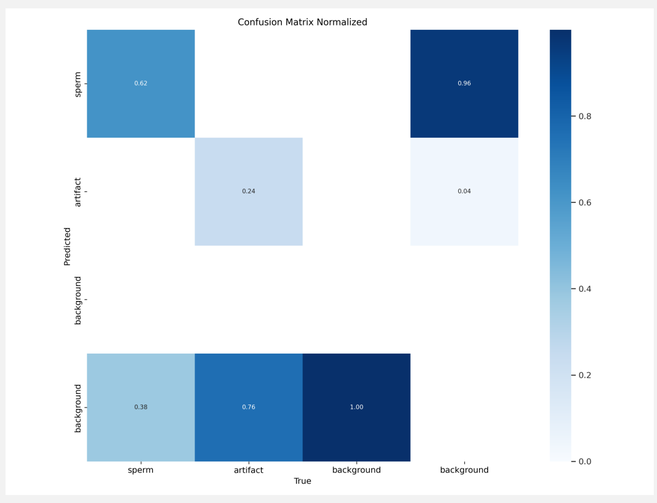
Segmentation

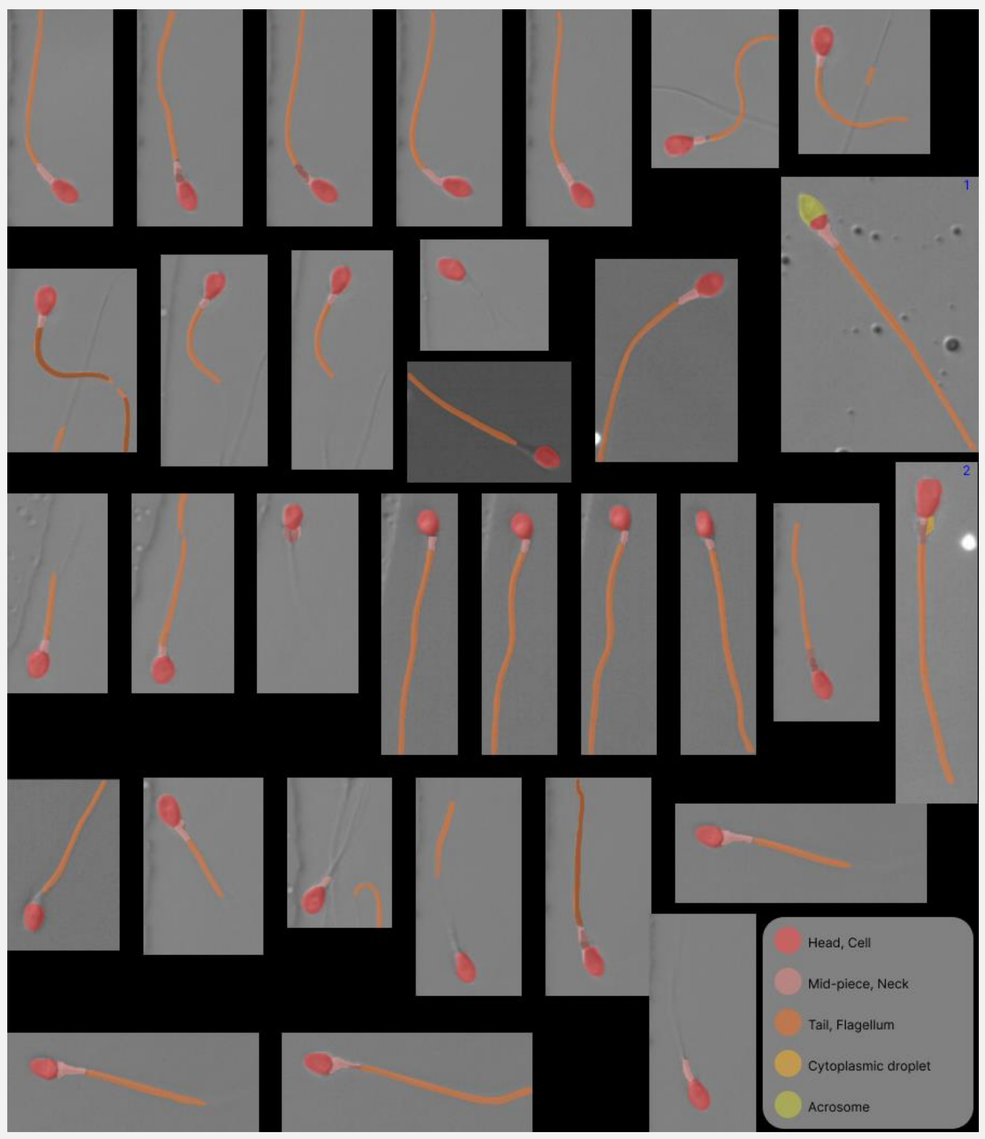




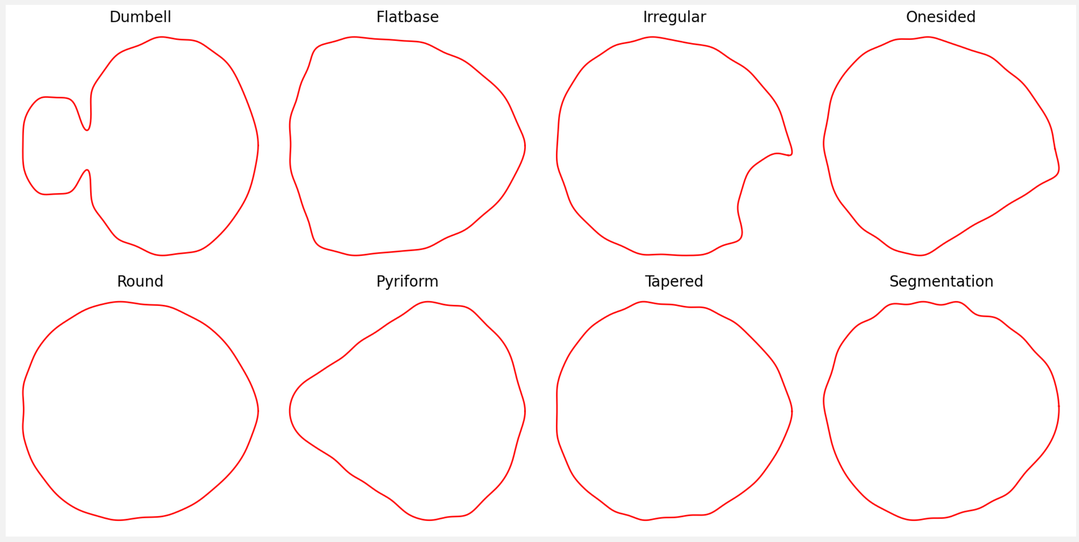
Object detection







Elliptic Fourier Descriptors, analysis of malformed spermatozoa sperm cells



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