

FlowCyPy is a cutting-edge simulation tool designed to create a digital twin of flow cytometry systems. By leveraging computational physics, optics, and signal processing, FlowCyPy models the intricate interactions between particles and light, the behavior of optical detectors, and the resulting electronic signals. It uses advanced scattering theory powered by PyMieSim to simulate forward scatter (FSC) and side scatter (SSC) signals, incorporating realistic noise, baseline shifts, and detector-specific characteristics. As part of the digital-twin paradigm, FlowCyPy enables researchers to replicate, predict, and optimize flow cytometry experiments in a virtual environment, reducing dependency on costly physical experiments. During this internship, you will validate FlowCyPy's outputs against experimental data and expand its capabilities, contributing to the development of a robust, predictive digital twin framework for flow cytometry.