Annotation tool for underwater videos

Marine biologists annotate large volumes of underwater video footage with general purpose tools, such as LabelMe and Label Studio. However, these tools do not account for the specific needs of underwater imagery: very high resolutions, low contrast, and color degradation due to water turbidity. This project aims at developing a tool specifically designed for annotating underwater videos, tailored to the workflow of marine researchers.

The proposed application will provide an interactive environment for loading and navigating high-resolution underwater video files, frame by frame, while recording three complementary types of annotations:
* Point/click annotations, marking the location of an individual fish with a single click.
* Bounding box annotations.
* Dense pixel-level segmentation, tracing the precise outline of a fish.

The labelling will support taxonomic annotations, i.e., a label hierarchy indicating the species, genus, and family, as well as a generic “fish” category for individuals that cannot be identified. Additionally, the tool will record how the fish identification was made. Each annotation will be tagged as either: **Visual**: the species is identifiable from the individual's own appearance, or **Contextual**: the species is inferred from surrounding evidence.

Technology: Python's Flask is preferred due to its simplicity, but alternatives can also be considered.