



ETH zürich



ROBOTIC CAMERA OPERATORS FOR PROFESSIONAL EVENT RECORDING

Problem – Challenge

Professional events are ideally recorded with a multi-camera system in order to offer the spectators the best overview on the live action and simultaneously a feeling of proximity. Very often, however, a production crew has to make do with fewer cameras, as the personnel cost for the camera operators is too high.

Solution

ETH researchers have developed an autonomous multi-camera system, which requires just one human camera operator, who commands all the cameras. The human operator is responsible of the creative tasks such as defining the field of view or which objects to track, while the autonomous camera system takes over the routine work like long-term tracking of people on stage, balls in a sports-field or cars in a race.

The challenges for implementing such a system are manifold. One aspect is choosing the right hardware for the robotic camera head, such as the motors and encoders, to mimic the smooth movements of a human camera operator. Another aspect is the actual tracking of an object. The researchers have built a custom-trained neural network, which analyzes frames from the live stream, computes the spatial position of the objects, and sends commands to the controller unit. Also important is a dedicated software, which predicts the real-time movement of the objects and plans camera and lens control according to cinematographic rules, that is, the optimal placement of an object within the frame.

The technology drew the attention of a Swiss production company. The inventors and the company joined forces and collaborated within the framework of an Innosuisse project. The project was very successful and laid the foundation of the ETH spin-off Seervision. The founding team are ETH inventors Nikolaos Kariotoglou and Reto Hofmann and their Innosuisse project partner Conrad von Grebel. Seervision's pilot product "The World's Most Advanced AI Cameraman" is market-ready.

