

Summary of the doctoral thesis:  
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"Virtual - director of photography"  
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The doctoral thesis focuses on the author's experiences during the shooting and post-production of the feature film "Speedway/Speedway," directed by Dorota Kędzierzawska. The film was shot in 2016, and post-production lasted three years (2017-2020). The most challenging task for the director of photography was filming the speedway races. Although they only lasted about fifteen minutes in the film, they were crucial for the entire picture.

The unique nature of speedway racing necessitated the use of innovative filming techniques to capture the dynamic and emotional aspects of the races. Prior Polish or international shooting experiences were of no use, as the only film to feature a speedway race was 'Money for Speed' from 1933. The methods used to film car races were also ineffective because the high vibrations made it hard to mount a (motion-picture) camera to a frame of a speedway bike. The "flare," a flaw of pebbles and pavement crumbs, posed a high risk to cameras and lenses mounted on speedway-quads. The use of drones was also deemed to be unsafe for players.

To find the right solution, it was important to make a pre-visualization of the movie and plan the scenes in a 3D environment. The team decided to shoot the race scenes in a virtual world, but this decision was not without its challenges. The specificity of the shots and the lack of previous experience made it necessary to explore new paths in the use of the latest technologies. Collaborating with the Center for Audiovisual Technologies (using Zbigniew Rybczyński's Cyclorama), the team utilized a KUKA robot. Ultimately, Motion Capture technology turned out to be the right solution, resulting in fully virtual race scenes. This allowed for greater opportunities to work in post-production, on lighting, depth of field, and color correction.

A significant issue has arisen regarding the authorship of the visual material created using this technique, and whether an outsider can create them on behalf of the director of photography in the virtual world. It seems best for the director of photography to oversee both real and

virtual images, but this requires new skills and a new approach to technologies, which are changing quickly.

Keywords: speedway, cinematography, post-production, VFX, motion control, motion capture, previs, LED Volume, 3D, cyclorama, CETA, virtual reality, virtual cinematographer, director of photography