

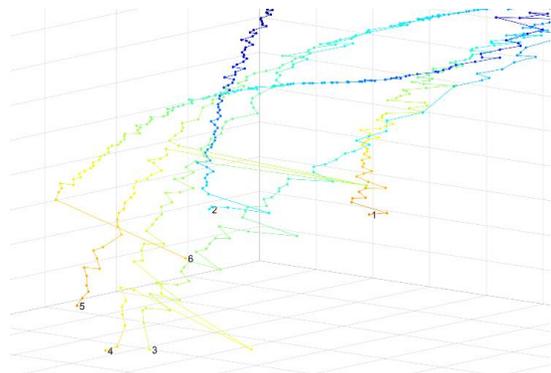
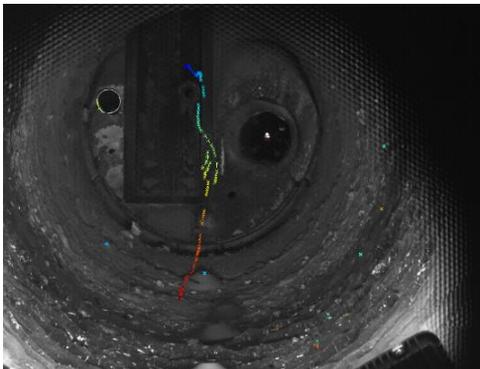


Master's Thesis

Investigation of image processing methods to combine particle trajectory sections in a rotary kiln

Since object tracking becomes a crucial and essential task in computer vision in recent several decades, many approaches have been developed to research trajectories of certain objects. Prerequisite for a successful tracking is to detect the objects correctly in each scene. Nevertheless, some objects are not able to be detected at times because of the lack of illumination, inappropriate angle, etc. Thus, locations of those objects at some times can not be obtained, which leads to trajectory sections instead of complete trajectories during the tracking process.

To solve the discussed problem above, a method to combine trajectory sections on time coordinate as post-processing for object tracking is desired. The basis for developing the method is the characteristic of each short trajectory section and its duration. Since the trajectory sections exist at different times with different trends, trajectory sections of a certain object can be identified and combined to a complete long trajectory. For the combination method 2D as well 3D information on the particles will be used. Experimental data in our project captured by a calibrated plenoptic camera is available for fuel particles in the rotary kiln.



Tasks:

- Literature review focusing on the combination of trajectory sections
- Developing algorithm to combine particle trajectory sections in a rotary kiln on time coordinate
- Implementation of the trajectory combination approach utilizing MATLAB
- Investigation of the performances of the approaches in terms of accuracy, efficiency, etc.
- Modifying and optimization of the approaches to obtain a better result
- Documentation of all the outcomes in either English or German

Requirements:

- We are looking for a highly self-motivated student in the field of mechanical engineering or related. Knowledge and experiences in MATLAB is a requirement.