

***VLZ 10 prof. James Damon***

***1. "Classification of Local Features in Natural Images"***

For natural images, a central goal is to identify the individual objects in the image, determine their individual properties and their relative relations. Approaches for distinguishing objects depend on methods such as edge detection methods, which often fail at locations such as corners where object features exhibit increased complexity. The exact local features depend on the geometric properties of the objects as well as the lighting properties and the apparent contours resulting from the view direction. Furthermore, additional information is provided by the changes in the image that occur as a result of movement in viewing direction. We will explain how recent developments using methods of singularity theory combined with geometry allow us to identify the local possible feature configurations resulting from the combination of properties, lighting, viewpoint, or movement of viewpoint. These developments build on previous results and introduce methods for the problems of singularity theory for mappings on stratified sets and the role of geometry of surfaces. It describes joint work with Peter Giblin and Gareth Haslinger.

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