Finding correspondences between two images of the same scene, taken from different viewpoints, with semantic features is a challenging problem. This paper proposes a Data-driven Morphology Salient Regions (DMSR) approach for detecting interest regions repeatedly. A binarization algorithm creates a compact image representation that is then analyzed for saliency using morphology. DMSR has comparable performance to the renowned Maximally Stable Extremal Regions (MSER) detector on structured scenes and better invariance to lighting, blur and on a high-resolution benchmark. This is achieved via significantly fewer detected regions, leading to better scalability. DMSR is shown to be a better choice than MSER for analysis of scientific imagery in the big data era, e.g., it detects precisely meaningful regions in images used for wild-life biometrics. The paper also introduces OxFrei, a dataset for transformation-independent detection evaluation.