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Simpler and faster: old-fashioned video saliency approach based on efficient projection kernels

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In order to solve many problems in Computer Vision, current state-of-art approaches leverage the use of deep architectures, whose impressive results are provided to the price of dramatic requirements in terms of data and computational resources.

Traditional approaches may come in hand by pursuing efficiency and portability at the expense of a less precise result. In this seminar I will present an old-fashioned video saliency approach based on the computation of Gray-Code Kernels (GCKs), a highly efficient filtering scheme used in literature almost exclusively for fast 2D pattern matching. GCKs are a family of kernels designed so that successive convolutions of an image with a set of such filters require only two operations per pixel, and thus provide an efficient scheme that allows a fast computation of image and video projections. Our implementation relies on the use of 3D kernels applied to overlapping blocks of frames and is able to gather meaningful spatio-temporal information with a very light computation. I will show that our method is able to effectively and efficiently identify the portion of the image where the motion is occurring, providing results comparable to methods specifically tailored to segmentation tasks.

BIO

Elena is a third year PhD student working in the Machine Learning & Vision unit at MaLGa, under the supervision of Nicoletta Noceti. Her research interests include DL and traditional methods for various motion understanding related tasks, such as motion detection, motion-based segmentation and human action classification.