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Otwarte Seminarium badawczo-rozwojowe EIS

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sala 429, budynek C-2, AGH

SUN: A Model of Visual Salience Using Natural

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ABSTRACT: As a result of having a foveated retina, we actively move our eyes in order to direct our highest resolution of visual processing towards interesting things. In fact, we move our eyes about three times a second: it is a decision we make about 172,000 times a day. How do we decide where to look?

People, unlike computer vision systems, can recognize a large number of objects and faces in a robust manner, in a variety of lighting conditions and with partial views. We have developed a biologically-inspired visual classifier called NIMBLE, for NIM with Bayesian Likelihood Estimation, that uses fixations based upon a salience map. The salience map and the information extracted from each fixation use the same features learned in an unsupervised way from natural images. An object is learned by storing the fixations and labels in an exemplar-based memory. At recognition time, a salience map is again generated and the extracted fixations compared with those in memory using Bayesian updates. The model parameters were tuned on Birds and Butterflies datasets, and then applied unchanged to Faces, Objects, and Flowers. This is in sharp contrast to most computer vision systems, which are usually tuned for the particular application. The model achieved state of the art performance for systems using a single feature type. Our approach achieves 78.5% accuracy on Caltech-101 and 75.2% on the 102 Flowers dataset when trained on 30 instances per class and it achieves 92.7% accuracy on the AR Face database with 1 training instance per person. The same features and parameters are used across these datasets to illustrate its robust performance.

SHORT BIO: Garrison W. Cottrell is a Professor of Computer Science and Engineering at UC San Diego. He is Director of the Interdisciplinary Ph.D. Program in Cognitive Science at UCSD, and the Director of the Temporal Dynamics of Learning Center, an NSF-sponsored Science of Learning Center involving 40 PI's at 17 institutions in three countries. He is also a founding PI of the Perceptual Expertise Network.

ZAPRASZAMY!

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