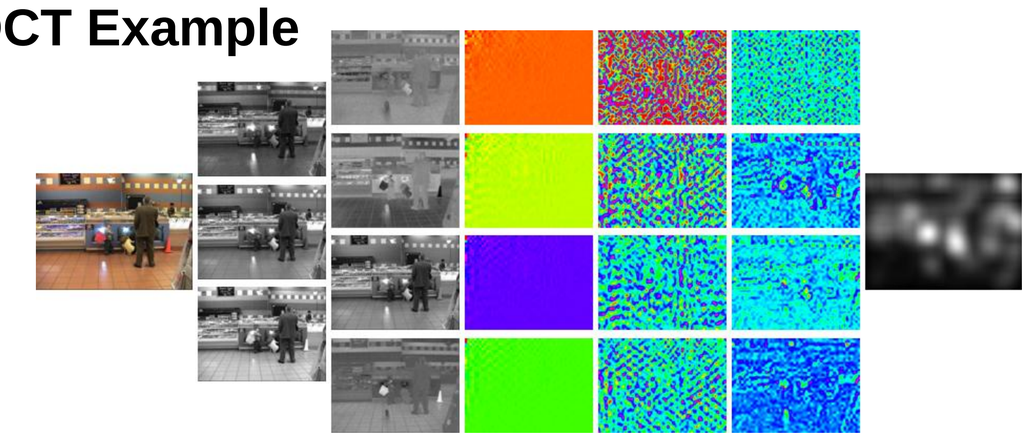
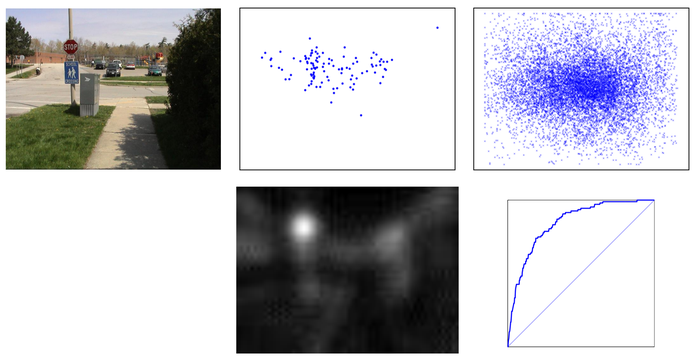
… continued
Evaluation Details

QDCT Example



Evaluation Measure

Center-bias corrected ROC AUC: Treat the saliency map at each possible saliency threshold as a binary classifier for eye fixations. Use the fixations of other images in the data set to sample data points in order to reflect a possible data set bias.



Evaluation Data Sets

Bruce-Tsotsos/Toronto: 120 images (681x511) with eye-tracking data of 20 subjects (4 seconds; free-viewing).

Kootstra-Schomacker: 100 images (1024x768) with eye-tracking data of 31 subjects that free-viewed the images. 5 image categories; images selected from the McGill calibrated color image database.

Judd/MIT: 1003 images (varying resolution and aspect ratio) and eye-tracking data of 15 viewers (3 seconds; free-viewing).

	Bruce-Tsotsos/Toronto				Kootstra-Schomacker				Judd/MIT			
	Lab	YUV	ICP	RGB	Lab	YUV	ICP	RGB	Lab	YUV	ICP	RGB
	Weighted Color Space and Non-Standard Axis											
ΔQDCT*	**0.7201**	0.7188	0.7174	0.7091	0.6104	**0.6125**	0.6110	0.6007	0.6589	**0.6751**	0.6712	0.6622
QDCT*	0.7195	0.7170	0.7158	0.7066	0.6085	0.6119	0.6106	0.5994	0.6528	0.6656	0.6623	0.6552
ΔEigenPQFT*	0.7183	0.7160	0.7144	0.7035	0.6053	0.6082	0.6064	0.5963	0.6527	0.6658	0.6617	0.6559
EigenPQFT*	0.7180	0.7137	0.7122	0.7006	0.6058	0.6073	0.6063	0.5934	0.6483	0.6611	0.6568	0.6493
ΔEigenSR*	0.7175	0.7153	0.7133	0.7014	0.6050	0.6077	0.6056	0.5941	0.6508	0.6649	0.6603	0.6534
EigenSR*	0.7162	0.7129	0.7112	0.6990	0.6038	0.6068	0.6044	0.5912	0.6467	0.6601	0.6554	0.6470
ΔPQFT*	0.7085	0.6969	0.6927	0.6930	0.5943	0.5994	0.5922	0.5868	0.6467	0.6503	0.6429	0.6468
PQFT*	0.7042	0.6881	0.6826	0.6891	0.5930	0.5970	0.5913	0.5861	0.6404	0.6416	0.6379	0.6398
PQFT/Bian [Bian, NIPS'09]	0.7035	0.6880	0.6817	0.6884	0.5928	0.5961	0.5911	0.5861	0.6404	0.6411	0.6375	0.6396
	Uniform Color Space Weights and Standard Axis											
ΔQDCT*	0.7191	0.7107	0.7070	0.7088	0.6050	0.6036	0.6078	0.6002	0.6539	0.6648	0.6618	0.6620
QDCT [Schauerte, WACV'12]	0.7180	0.7079	0.7039	0.7056	0.6036	0.6005	0.6079	0.5987	0.6517	0.6572	0.6552	0.6551
ΔEigenPQFT*	0.7148	0.7030	0.7024	0.7026	0.6005	0.5963	0.6045	0.5959	0.6490	0.6530	0.6548	0.6556
EigenPQFT*	0.7141	0.7006	0.6982	0.7006	0.5984	0.5939	0.6023	0.5934	0.6461	0.6496	0.6518	0.6491
ΔEigenSR*	0.7142	0.7135	0.7006	0.7013	0.6003	0.5951	0.6028	0.5937	0.6477	0.6504	0.6534	0.6531
EigenSR*	0.7132	0.6998	0.6969	0.6988	0.5975	0.5930	0.6007	0.5909	0.6448	0.6486	0.6502	0.6466
ΔPQFT*	0.7022	0.6925	0.6868	0.6927	0.5803	0.5826	0.5877	0.5850	0.6431	0.6441	0.6380	0.6465
PQFT [Guo, CVPR'08]	0.6974	0.6858	0.6796	0.6884	0.5788	0.5808	0.5860	0.5846	0.6368	0.6368	0.6271	0.6396
	Non-Quaternion Spectral Baseline Algorithms											
DCT [Hou, PAMI'12]	0.7137	0.7131	0.7014	0.6941	0.6052	0.6089	0.6049	0.5907	0.6465	0.6604	0.6556	0.6461
ΔPFT [Peters, JoV'08]	0.7177	0.7170	0.7079	0.7014	0.6072	0.6107	0.6084	0.5945	0.6502	0.6601	0.6583	0.6523
PFT [Guo, CVPR'08]	0.7140	0.7120	0.7025	0.6958	0.6057	0.6079	0.6058	0.5908	0.6445	0.6590	0.6572	0.6446
SR [Hou, CVPR'07]	0.7156	0.7144	0.7051	0.6983	0.6059	0.6090	0.6061	0.5916	0.6462	0.6599	0.6573	0.6461
	Baseline Algorithms (algorithm-specific feature spaces)											
CAS [Goferman, PAMI'12]	0.6921				0.6034				0.6622			
AIM [Bruce, JoV'09]	0.6986				0.5749				0.6662			
Judd** [Judd, ICCV'09]	0.6847				0.5793				**0.7696**			
GBVS [Harel, NIPS'07]	0.6703				0.5791				0.6539			
Itti [Itti, PAMI'98]	0.6492				0.5672				0.6433			
	Human Baseline											
Ideal	0.878				0.621				0.908			

*: First presented/evaluated in this paper. **: Incorporates high-level cues such as, e.g., person detections. Δ: multiple scales

Spectral Saliency Matlab Toolbox

Our reference implementation of all evaluated real-valued and quaternion-based spectral algorithms is available under BSD license at http://bit.ly/RAPmMk

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Code is available at http://bit.ly/RAPmMk