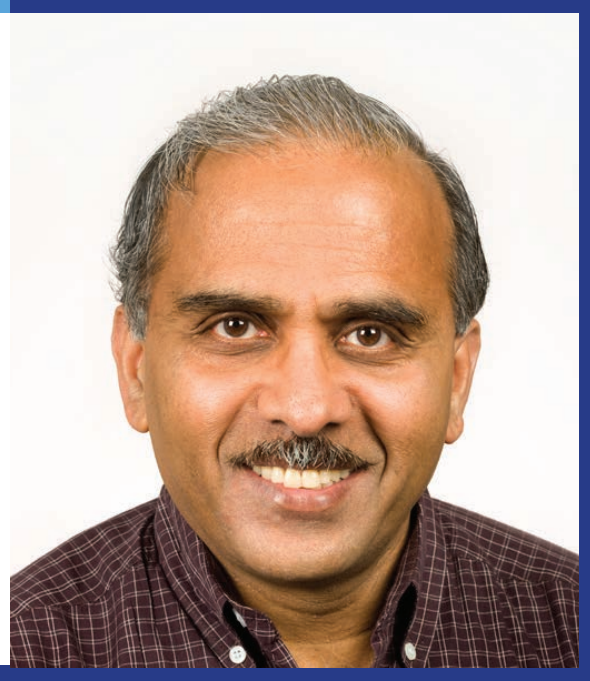
香港浸會大學
HONG KONG BAPTIST UNIVERSITY
計算機科學系
Department of Computer Science

Department of Computer Science
Distinguished Lecture Series 2015/16

New Correlation Filter Designs and Applications



4 - 5pm | Jun 22, 2016 | Wednesday

LT1 (SCT501), Science Tower, Ho Sin Hang Campus

Prof. Vijayakumar Bhagavatula

U.A. & Helen Whitaker Professor of
Electrical and Computer Engineering
Associate Dean for Graduate and Faculty Affairs
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Abstract

In many pattern recognition problems, the main task is to match two images of an object (e.g., face, iris, vehicle, etc.) that may exhibit appearance differences due to factors such as translation, rotation, scale change, occlusion, illumination variations and others. One class of methods to achieve accurate object recognition in the presence of such appearance variations is one where features computed in a sliding window in the target image are compared to features computed in a stationary window of the reference image. Correlation filters are an efficient frequency-domain method to implement such sliding window matching. They also offer benefits such as shift-invariance (i.e., the object of interest can be off-center), no need for segmentation, graceful degradation and closed-form solutions. While the origins of correlation filters go back more than thirty years, there have been some very interesting and useful advances in correlation filter designs and their applications. For example, the new maximum margin correlation filters (MMCFs) show how the superior localization capabilities of correlation filters can be combined with the generalization capabilities of support vector machines (SVMs). Another major research advance is the development of vector correlation filters that use features (e.g., HOG) extracted from the input image rather than just input image pixel values. While past application of correlation filters focused mainly on automatic target recognition, more recent applications include face recognition, iris recognition, palmprint recognition and visual tracking. This talk will provide an overview of correlation filter designs and applications, with particular emphasis on these more recent advances.

Biography

Prof. Vijayakumar ("Kumar") Bhagavatula received his Ph.D. in Electrical Engineering from Carnegie Mellon University (CMU), Pittsburgh and since 1982, he has been a faculty member in the Electrical and Computer Engineering (ECE) Department at CMU where he is now the U.A. & Helen Whitaker Professor of ECE and the Associate Dean for the College of Engineering. He served as the Associate Head of the ECE Department and also as its Acting Department Head. Professor Kumar's research interests include Pattern Recognition and Coding and Signal Processing for Data Storage Systems and for Digital Communications. He has authored or co-authored over 600 technical papers, twenty book chapters and one book entitled Correlation Pattern Recognition. He served as a Topical Editor for Applied Optics and as an Associate Editor of IEEE Trans. Information Forensics and Security. Professor Kumar is a Fellow of IEEE, a Fellow of SPIE, a Fellow of Optical Society of America (OSA) and a Fellow of the International Association of Pattern Recognition (IAPR).

Enquiry

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