



Electrical Engineering Department
■ ■ ■ ■ ■ Electronics
■ ■ ■ ■ ■ Computers
■ ■ ■ ■ ■ Communications



Computer
Science
Department

TCE GUEST TALK

Peter Meer

Rutgers University

Tuesday November 24th 2015

11:30 Taub 337 CS Building

Hosts: Alfred Bruckstein & Michael Lindenbaum

Robust Estimator for Multiple Inlier Structures

Abstract

In the generalized projection-based M-estimator (gpbM), published a few years ago, multiple structures with different scales were estimated without the scale parameter specified for each inlier structure. However, the gpbM can be defined from much simpler assumptions. From M trials based on the elemental subsets, we find a small group of the data points which produces the minimum sum of the Mahalanobis distances, and expand it to obtain the scale of a structure. This value is used in the mean shift to recover the structure itself. The iterative process returns the result in a list sorted by strength, where the inlier structures are always the strongest ones at the beginning. Several synthetic and real examples are presented to illustrate every aspect of this algorithm. Joint work with Xiang Yang Dept. of Mechanical and Aerospace Engineering, Rutgers University.

Bio

Peter Meer received the Dipl. Engn. degree from the Bucharest Polytechnic Institute, Romania in 1971, and D.Sc. from the Technion in 1986, both in electrical engineering. In 1991 he joined the Department of Electrical and Computer Engineering, Rutgers University, and is currently a Professor. He has held visiting appointments in Japan, Korea, Sweden, Israel and France. He was an Associate Editor of the IEEE Transaction on Pattern Analysis and Machine Intelligence between 1998 and 2002, was a Guest Editor of Computer Vision and Image Understanding for a special issue on robustness in computer vision in 2000, and was a member of the Editorial Board of Pattern Recognition between 1989 and 2005. With coauthors Dorin Comaniciu and Visvanathan Ramesh he received at the 2010 CVPR the Longuet-Higgins prize for fundamental contributions in computer vision in the past ten years. His research interest is in application of modern statistical methods to image understanding problems. He is an IEEE Fellow.

Electrical Engineering Department
■ ■ ■ ■ ■ Electronics
■ ■ ■ ■ ■ Computers
■ ■ ■ ■ ■ Communications



Computer
Science
Department



TCE MINI SEMINAR

Peter Meer

Rutgers University

Hosts: Alfred Bruckstein & Michael Lindenbaum

From Objective Functions in Computer Vision to Robust Inlier Structures

Part I - Wednesday, November 4th, 2015 - 10:30-12:30 601 CS Taub Building
Part II - Wednesday, November 11th, 2015 - 10:30-12:30 601 CS Taub Building
Part III - Wednesday, November 18th, 2015 - 10:30-12:30 601 CS Taub Building

Abstract

In these three lectures a (personal) view is given on how from linear/nonlinear objective functions at the input, one can build non robust or robust estimation. If a higher dimensional linear space is considered for non linear inputs, one could, directly in total least squares; or iteratively in Levenberg-Marquardt algorithm, non robustly estimate the features. A robust method of mean shift is presented both for segmentation and tracking. Generalizations, to nonlinear mean shift in Riemannian manifolds and to mean shift clustering in the kernel space, will be also described. Using the higher dimensional linear space, a new algorithm can be designed which, without the scales provided, returns all the inlier structures.

Bio

Peter Meer received the Dipl. Engn. degree from the Bucharest Polytechnic Institute, Romania in 1971, and D.Sc. from the Technion in 1986, both in electrical engineering. In 1991 he joined the Department of Electrical and Computer Engineering, Rutgers University, and is currently a Professor. He has held visiting appointments in Japan, Korea, Sweden, Israel and France. He was an Associate Editor of the IEEE Transaction on Pattern Analysis and Machine Intelligence between 1998 and 2002, was a Guest Editor of Computer Vision and Image Understanding for a special issue on robustness in computer vision in 2000, and was a member of the Editorial Board of Pattern Recognition between 1989 and 2005. With coauthors Dorin Comaniciu and Visvanathan Ramesh he received at the 2010 CVPR the Longuet-Higgins prize for fundamental contributions in computer vision in the past ten years. His research interest is in application of modern statistical methods to image understanding problems. He is an IEEE Fellow.