Call for Chapters

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Hybrid Metaheuristics for Image Analysis

Editor
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Important Dates
Proposal Submission: 15th May 2017
Notification of Acceptance of Proposals: 31st May 2017
Full Chapter Submission: 15th September 2017
Chapter Review Notification: 15th November 2017
Interim Version Due: 15th December 2017
Final Notification: 15th January 2018
Final Revised Chapter Due: 15th February 2018
Final Acceptance: 15th March 2018

Purpose

A metaheuristic is a higher-level procedure designed to select a heuristic (partial search algorithm) that may lead to a sufficiently good solution to an optimization problem, especially with incomplete or imperfect information. The basic principle of metaheuristics is to sample a set of solutions which is large enough to be completely sampled. As metaheuristics make few assumptions about the optimization problem to be solved, they may be put to use in a variety of problems. Metaheuristics do not however, guarantee that a globally optimal solution can be found on some class of problems since most of them implement some form of stochastic optimization. Hence the solution found is often dependent on the set of random variables generated. By searching over a large set of feasible solutions, metaheuristics can often find good solutions with less computational effort than optimization algorithms, iterative methods, or simple heuristics. As such, they are useful approaches for optimization problems.

Even though the metaheuristics are robust enough to yield optimum solutions, yet they often suffer from time complexity and degenerate solutions. In an effort to alleviate these problems, scientists and researchers have come up with the hybridization of the different metaheuristic

approaches by conjoining with other soft computing tools and techniques to yield failsafe solutions. In a recent advancement, quantum mechanical principles are being employed to cut down the time complexity of the metaheuristic approaches to a great extent. Thus, the hybrid metaheuristic approaches have come a long way in dealing with the real life optimization problems quite successfully.

Proper and faithful analysis of digital images has been in the helm of affairs in the computer vision research community given the varied amount of uncertainty inherent in digital images. Images exhibit varied uncertainty and ambiguity of information and hence understanding an image scene is far from being a general procedure. The situation becomes even graver when the images become corrupt with noise artifacts. The applications of proper analysis of images encompass a wide range of applications which include image processing, image mining, image inpainting, video surveillance, intelligent transportation systems to name a few. One of the notable areas of research in image analysis is the estimation of age progression in human beings through analysis of wrinkles in face images, which can be further utilized for tracing unknown or missing persons. Hurdle detection is one of the common tasks in robotic vision that have been done through image processing, by identifying different type of objects in the image and then calculating the distance between robot and hurdles. Image analysis has a lot to contribute in this direction.

Description and Scope of the Book

The proposed volume intends to bring together researchers to report the latest results or progress in the development of hybrid metaheuristic techniques for faithful image analysis and understanding. As such, the focus of this volume is the methods of computational intelligence, with a focus on hybrid metaheuristics applied to image analysis and understanding. Needless to state, the field of image analysis and understanding encompasses a wide range of image preprocessing and image processing applications. I am soliciting contributions in the following main areas which include (i) Image Thresholding, (ii) Image Segmentation, (iii) Image Enhancement as well as (iv) Image Analysis.

Recommended Topics:

This book solicits contributions that also include the basics, fundamentals of the field of image analysis and understanding addressed by hybrid metaheuristics supported by coding examples and real life case studies. Each chapter is expected to be self-contained and cover an in-depth analysis of real life applications of hybrid metaheuristics to image analysis and understanding. The book is aimed to encompass the following broad topics of image analysis and understanding viz., (i) Image Thresholding, (ii) Image Segmentation, (iii) Image Enhancement and (iv) Image Analysis.

Submissions are solicited on the following topics, but not limited to:

PART I: Image Thresholding

- Image thresholding typically by rough-fuzzy-genetic algorithms, neutrosophic set assisted evolutionary optimization, fast fuzzy c-means supported evolutionary particle swarm optimization etc.

PART II: Image Segmentation
- Image segmentation using hybrid rough-neuro-fuzzy-genetic systems and the like
- Motion segmentation using hybrid metaheuristic technique inspired optical flow techniques

PART III: Image Enhancement
- Image preprocessing and enhancement using population based optimization techniques, hybrid SVM based adaptive filters, quantum inspired neural networks based hybrid genetic algorithm to name a few
- Image Denoising

PART IV: Image Analysis
- Image analysis
- Image understanding
- Image inpainting
- Image mining
- Age estimation based on face recognition
- Pattern recognition and Handwriting recognition
- Three dimensional image processing
- Medical image processing
- Remote sensing imagery
- Video processing
- Emotion and Gesture analysis
- Human mind analysis
- Image Steganography
- Survey and/or review on image analysis and understanding

Submission Deadlines

The book is to be published by **Springer International Publishing AG, Switzerland**. It is expected to be published in 2018.

PROPOSAL SUBMISSION: Prospective authors should submit a 2-3 page proposal by **15th May 2017** clearly explaining the mission and concerns of the proposed chapter. Authors will be notified by **31st May 2017** about the status of their proposals.

FULL CHAPTER SUBMISSION: Chapters have to be 25-30 pages length and will be reviewed by two/three expert reviewers to ensure the quality of the volume. The deadline of submission is **15th September 2017.**

CHAPTER REVIEW NOTIFICATION: Authors of submitted chapters will be notified by **15th November 2017** about their acceptance/rejection.

INTERIM VERSION DUE: Interim version of the accepted chapters is expected to be submitted by **15th December 2017.**

FINAL NOTIFICATION: A second round of review of the chapters along with plagiarism check will be carried out and the authors of the accepted chapters will be notified on **15th January 2018.**

FINAL REVISED CHAPTER DUE: Camera-ready version of the accepted chapters incorporating revisions (if any) is expected to be submitted by **15th February 2018.**

FINAL ACCEPTANCE: The final acceptance notification of the chapters will be sent to the contributing authors by **15th March 2018.**

Inquiries and submissions can be forwarded to:

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