Genetic Algorithms in Materials Science & Engineering (GAMS2007)

Symposium G at: 2007 E-MRS FALL MEETING

Welcome!

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GENERAL INFORMATION: Genetic algorithms provide a useful tool for solving difficult optimisation tasks in various domains of science and technology. They mimic, in a simplified way, the evolutionary mechanisms known from the world of living organisms: mutation, selection and crossover.
GAMS2007 will be a forum for establishing the current state-of-the-art of these techniques and their applications in materials science. Presentations will focus both on fundamentals of genetic algorithm methodology and on applications of these techniques in materials science, with the aim of promoting this methodology within the field and thus encouraging the more widespread application of these techniques to solve more difficult and challenging scientific and technological problems in the future. Novel applications will be encouraged, as well as presentation of public-domain codes that enable applications by any user.

TOPICS

APPLICATIONS: control of crystal growth and thin film growth processes, materials design, structure solution, materials manufacturing, texture analysis, determination of surface structure, structure modelling, design of molecules with specific desired properties, including drug design, structure prediction, modelling of clusters, simulation of specular reflectivity for thin layers, liquid crystals & Langmuir-Blodgett films.
FUNDAMENTALS: genetic operators, treatment of constraints, soft and hard penalties, convergence criteria, hybrid methods, ready-to-use software, parallel computing strategies, other global-optimisation methods.

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Background of this poster: recrystallized metallic microstructure simulated through a genetic algorithm and cellular automata (by Nirupam Chakraborti and Sudipto Ghosh of Indian Institute of Technology, Kharagpur, India).