




## Editorial: Special Issue on Computer-Aided Generative Design

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### 1 INTRODUCTION

Recent advances in manufacturing and material science enable the fabrication of complex digital geometric models that are difficult or impossible to produce by using conventional manufacturing technologies. The unprecedented manufacturing flexibility offers opportunities and challenges for the computer-aided design of such digital models. Even for the most experienced designers, their intuition might be limited when manually exploring such unprecedented large design space. To empower designers, computer algorithms are being developed to generate desired designs under given design objectives and constraints. Such an algorithm-driven design process is now known as generative design. Example approaches range from shape and topology optimization to shape grammar-based design, and to machine learning-based designs, among others. The flexibilities in generative design and additive manufacturing are increasingly being combined to produce disruptive high-performance functional structures and digital materials with applications in aerospace, automotive, medical implants, soft robots, customized consumer products, and beyond. This vibrant research area is receiving growing attention in multiple disciplines, such as geometric modeling, graphics, numerical optimization, computational mechanics, education as well as economics. This special issue focuses on the last two areas.

### 2 BRIEF OF ACCEPTED PAPERS

Zhang et al. (Semi-Continuous Hidden Markov Model Optimized Pronunciation Pattern Recognition in English Education) study the improved recognition algorithm and use the DTW in speech recognition to automatically recognize the learner's English pronunciation, realize basic recognition and scoring, and provide English learners with more feasible pronunciation information feedback. Wang (Computer-Aided Design Instruction System Based on BP Neural Network) used the BP neural network as the main body to research the computer-aided teaching system. Liu (Research on the Evaluation Effect of English Network Based on CADATS) used CADATS to conduct an adaptive test of students' English ability and tested the performance of CADATS in exams and adaptive tests. Sun and Gao (College Students' Psychological Cognitive Aided Education Based on Computer-Aided Design) uses the two access methods of computer access mode and mobile terminal access mode and sets the server management module and the client test module. Xu (Computer-Aided Design of Personalized Recommendation in Teaching System) provides a reference example for promoting the application of recommendation system in teaching aid system

and the development of teaching aid system, and also improves the auxiliary quality of teaching aid system and provides theoretical reference for subsequent related research. Cui et al. (Application of Automatic Scoring of English Assessment Improved by Computer-Aided Design) used latent semantic analysis to extract features from English content and identify its specific meaning. Moreover, this paper used the syntax analyzer StanfordParser to analyze the diversity of the sentence structure. Shi et al. (Research on Improving the Efficiency of English Network Assessment using Computer-Aided Design) built an English network test system based on computer-aided technology.

Shen and Cai (Computer-Aided Action Simulation of Exploring Aerobics Athletes) established a parametric whole-body geometry model based on human anatomy and anthropometry. Shi and sun (Computer-aided Cloud Computing for Advertising Promotion System) build a strong online advertising and process management system based on the cloud computing platform. Zhang et al. (Education of Recognition Training Combined with Hidden Markov Model to Explore English Speaking) evaluates the learner's spoken pronunciation from the vocal segment, the super-sound segment and the perception domain of the speech signal and improves the correlation between the computer score and the expert manual score. Ma (CAD Data Mining in Application of Intelligent Sports Training System) combined the actual movement of athletes and the human body recognition technology to construct a sports training system. Du (Optimization of Speech Recognition System of English Education Industry based on Machine Learning) constructed an English speech recognition system based on machine learning from the perspective of machine learning. Zhang (Research on Economic Development Strategy Assisted by Computational Space Clustering) combined spatial clustering technology to construct a regional research simulation model and set several factors to study the law of regional economic development. Zhang (Computer-Aided Simulation on Economic System Architecture) used a computer-aided approach to build a regional economic system architecture model based on system dynamics.

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