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1	**Title:**	[Markerless Vision-Based Augmented Reality for Urban Planning](#)
	Author:	Carozza, L., Tingdahl, D., Bosché, F. and van Gool, L.
	Journal:	Computer-Aided Civil and Infrastructure Engineering, Volume 29, Issue 1, pages 2–17, January 2014
	Abstract:	Augmented Reality (AR) is a rapidly developing field with numerous potential applications. For example, building developers, public authorities, and other construction industry stakeholders need to visually assess potential new developments with regard to aesthetics, health and safety, and other criteria. Current state-of-the-art visualization technologies are mainly fully virtual, while AR has the potential to enhance those visualizations by observing proposed designs directly within the real environment. A novel AR system is presented, that is most appropriate for urban applications. It is based on monocular vision, is markerless, and does not rely on beacon-based localization technologies (like GPS) or inertial sensors. Additionally, the system automatically calculates occlusions of the built environment on the augmenting virtual objects. Three datasets from real environments presenting different levels of complexity (geometrical complexity, textures, occlusions) are used to demonstrate the performance of the proposed system. Videos augmented with our system are shown to provide realistic and valuable visualizations of proposed changes of the urban environment. Limitations are also discussed with suggestions for future work.

2	**Title:**	[Effects of Interactive Real-Time Simulations and Humanoid Avatars on Consumers' Responses in Online House Products Marketing](#)
	Author:	Mahdjoubi, L., Hao Koh, J. and Moobela, C.
	Journal:	Computer-Aided Civil and Infrastructure Engineering, Volume 29, Issue 1, pages 31-46, January 2014
	Abstract:	Interactive product presentation techniques have recently gained importance in online marketing of house products. Real-time simulation offers a high level interactive presentation with more powerful features to present product functions and variations. This article presents a novel computational approach for engaging and supporting consumers in making informed choices about purchasing house products. It involved the development and testing of an online interactive real-time simulation for house product marketing (the Virtual House Showroom-VHS). This model also included optional humanoid avatars, representing a virtual buyer–seller experience. The research assessed the effectiveness of the VHS on consumers' cognitive and affective responses. In particular, it examined

whether consumers' responses to real-time simulation with a humanoid avatar are significantly different from their responses to the model without the avatar. Participants (n = 110) were organized into two groups. Group 1 (n = 56) evaluated VHS without the humanoid avatar and group 2 (n = 54) appraised the model with the avatar. The results confirmed that interactive online real-time simulation technologies without the avatar have significant effects on consumers' cognitive learning, affect, and behavior. However, it was found that the humanoid avatar had no significant effect on respondents' decision-making. Further research was suggested to improve the usability of real-time simulation in the marketing of house products.

3	Title:	[Development and Implementation of an Industry Foundation Classes-Based Graphic Information Model for Virtual Construction](#)
	Author:	Zhang, J., Yu, F., Li, D. and Hu, Z.
	Journal:	Computer-Aided Civil and Infrastructure Engineering, Volume 29, Issue 1, pages 60–74, January 2014
	Abstract:	Virtual Construction (VC) applications encounter difficulty in sharing and exchanging information with one another due to the long periods of interoperability limitation. To address these issues, an Industrial Foundation Classes-based graphic information model (IFC-GIM) is developed according to the exchange requirement of VC, and using the representations of three models in the IFC schema and its extension by defining the dynamic property set and properties for animation. The three models include the physical object model, the construction information model, and the realistic model. An OpenGL-based VC platform is developed and applied to a 440-m-high building to implement the IFC-GIM. The results demonstrate that the proposed IFC-GIM lays the foundation for data sharing and exchange among VC systems and other IFC-compliant applications, which, in turn, significantly reduces the modeling effort for VC and increases the value of VC results. Furthermore, animation is applied to simulate construction activities by the VC platform in addition to color and transparency, enhancing realistic feelings in 4D applications.

4	Title:	[VAIT: A Visual Analytics System for Metropolitan Transportation](#)
	Author:	Liu, S., Pu, J., Luo, Q., Qu, H., Ni, L.M., Krishnan, R.
	Journal:	IEEE Transactions on Intelligent Transportation Systems, Volume:14, Issue: 4, pages 1586 - 1596, December 2013

Abstract: With the increasing availability of metropolitan transportation data, such as those from vehicle Global Positioning Systems (GPSs) and road-side sensors, it has become viable for authorities, operators, and individuals to analyze the data for better understanding of the transportation system and, possibly, improved utilization and planning of the system. We report our experience in building the Visual Analytics for Intelligent Transportation (VAIT) system, which is the first system on real-life large-scale data sets for intelligent transportation. Our key observation is that metropolitan transportation data are inherently visual as they are spatio-temporal around road networks. Therefore, we visualize and manage traffic data, together with digital maps, and support analytical queries through this interactive visual interface. As a case study, we demonstrate VAIT on real-world taxi GPS and meter data sets from 15 000 taxis running for two months in a Chinese city of over 10 million people. We discuss the technical challenges in data calibration, storage, visualization, and query processing and offer first-hand lessons learned from developing the system. Based on our extensive empirical experiment results, VAIT beats state-of-the-art methods and systems in terms of scalability, efficiency, and effectiveness and offers us an easy-to-use, efficient, and scalable platform to shed more light on intelligent transportation research.

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Title:	Novel Speed-Bump Design and Optimization for Energy Harvesting From Traffic
Author:	Pirisi, A., Mussetta, M., Grimaccia, F., Zich, R.E.
Journal:	IEEE Transactions on Intelligent Transportation Systems, Volume:14, Issue: 4, pages 1983 - 1991, December 2013

Abstract: In recent years, the increase in computational capability and development of innovative multiphysic techniques has determined a growing interest toward modeling and optimization in engineering system design for green energy applications. In this field, advanced soft computing techniques can be applied by engineers to several problems and to be used in an optimization process to find out the best design and, thus, to improve the system performance. These techniques also promise to give new impulse to research on renewable systems and, particularly in the last five years, on the so-called energy-harvesting devices (EHDs). This paper presents the optimization of a tubular permanent-magnet linear generator used for applications of energy harvesting from traffic. The optimization process is developed by means of hybrid evolutionary algorithms to reach the best overall system efficiency and the impact on the environment and transportation systems. Finally, an experimental validation of the designed EHD prototype is presented.

6	Title:	[Integrated Urban Traffic Control for the Reduction of Travel Delays and Emissions](#)
	Author:	Lin, S., De Schutter, B., Xi, Y., Hellendoorn, H.
	Journal:	IEEE Transactions on Intelligent Transportation Systems, Volume:14, Issue: 4, pages 1609 - 1619, December 2013
	Abstract:	Refining transportation mobility and improving the living environment are two important issues that need to be addressed in urban traffic. To reduce traffic delays and traffic emissions for urban traffic networks, this paper first proposes an integrated macroscopic traffic model that integrates a macroscopic urban traffic flow model with a microscopic traffic emission model for individual vehicles. This integrated model is able to predict the traffic flow states and the emissions released by every vehicle at different operational conditions, i.e., the speed and the acceleration. Then, model predictive control (MPC) is applied to control urban traffic networks based on this integrated traffic model, aiming at reducing both travel delays and traffic emissions of different gases. Finally, simulations are performed to assess this multiobjective control approach. The obtained simulation results illustrate the control effects of the model predictive controller.

7	Title:	[On the periodicity of traffic oscillations and capacity drop: The role of driver characteristics](#)
	Author:	Danjue Chen, Soyoung Ahn, Jorge Laval, Zuduo Zheng
	Journal:	Transportation Research Part B: Methodological, Volume 59, January 2014, Pages 117–136
	Abstract:	This paper shows that traffic hysteresis arises due to variable driver characteristics within each driver and has a profound reproducible impact on the periodicity and development of traffic oscillations and the bottleneck discharge rate. Following an oscillation, traffic initially exhibits lower density and flow; then it evolves toward and eventually exceeds the equilibrium, whereupon another oscillation is instigated by an aggressive driver(s) with relatively small response time and minimum spacing. Thereafter, traffic reverts to lower density and flow and repeats the evolutionary cycle. Aggressive driver behavior also leads to hysteresis loops that induce the upstream propagation of oscillations; with larger hysteresis loops inducing larger oscillation growth. Our finding also suggests that the bottleneck discharge rate can diminish by 8–23% when drivers adopt larger response times in reaction to disturbances. This finding suggests that existing capacity-drop theories, with lane-changes as the main factor, may be incomplete.

8	Title:	[Extreme values, invariance and choice probabilities](#)
	Author:	Lars-Göran Mattsson, Jörgen W. Weibull, Per Olov Lindberg
	Journal:	Transportation Research Part B: Methodological, Volume 59, January 2014, Pages 81–95
	Abstract:	Since the pioneering work of McFadden (1974), discrete choice random-utility models have become work horses in many areas in transportation analysis and economics. In these models, the random variables enter additively or multiplicatively and the noise distributions take a particular parametric form. We show that the same qualitative results, with closed-form choice probabilities, can be obtained for a wide class of distributions without such specifications. This class generalizes the statistically independent distributions where any two c.d.f.:s are powers of each others to a class that allows for statistical dependence, in a way analogous to how the independent distributions in the MNL models were generalized into the subclass of MEV distributions that generates the GEV choice models. We show that this generalization is sufficient, and under statistical independence also necessary, for the following invariance property: all conditional random variables, when conditioning upon a certain alternative having been chosen, are identically distributed. While some of these results have been published earlier, we place them in a general unified framework that allows us to extend several of the results and to provide proofs that are simpler, more direct and transparent. Well-known results are obtained as special cases, and we characterize the Gumbel, Fréchet and Weibull distributions.

9	Title:	[A supply chain network design model for biomass co-firing in coal-fired power plants](#)
	Author:	Md.S. Roni, Sandra D. Eksioglu, Erin Searcy, Krishna Jha
	Journal:	Transportation Research Part E: Logistics and Transportation Review, Volume 61, January 2014, Pages 115–134
	Abstract:	We propose a framework for designing the supply chain network for biomass co-firing in coal-fired power plants. This framework is inspired by existing practices with products with similar physical characteristics to biomass. We present a hub-and-spoke supply chain network design model for long-haul delivery of biomass. This model is a mixed integer linear program solved using benders decomposition algorithm. Numerical analysis indicates that 100 million tons of biomass are located within 75 miles from a coal plant and could be delivered at $8.53/dry-ton; 60 million tons of biomass are located beyond 75 miles and could be delivered at $36/dry-ton.

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Title:	Global intermodal liner shipping network design
Author:	Zhiyuan Liu, Qiang Meng, Shuaian Wang, Zhuo Sun
Journal:	Transportation Research Part E: Logistics and Transportation Review, Volume 61, January 2014, Pages 28–39
Abstract:	This paper presents a holistic analysis for the network design problem of the intermodal liner shipping system. Existing methods for liner shipping network design mainly deal with port-to-port demand. However, most of the demand has inland origins and/or destinations. Thus, it is necessary to cope with inland origin–destination (OD) pairs involving a change in transport mode from inland transportation to maritime shipping. A method is first proposed to convert inland OD demand to port-to-port demand. Then, a framework for global intermodal liner shipping network design is proposed. Finally, the proposed methodology is applied to and numerically verified by a large-scale network example.