

## **Scheduling of Traffic Lights**

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### **Abstract**

Big and highly populated cities face traffic congestion problems in almost every country. There are four standard driving modes which are acceleration, cruising, deceleration and idling. Vehicle fuel consumption is being used unnecessarily during idling and acceleration modes instead of steady-speed driving. To minimize the fuel consumption, it will be helpful to reorganize traffic lights with the help of green-wave strategy. In this paper, the traffic light signalization in a crowded city is studied by the help of simulation. The timing of signalization is obtained by using production order quantity model and compared to other signalization techniques through simulation. The results show that production order

quantity model can be successfully used to determine timing of traffic lights. Data used are obtained from Istanbul Municipality.

### **Keywords**

Green-wave strategy, production order quantity model, simulation, traffic signalization, timing schedule

### **Biographies**

**İrem Ünal** is an undergraduate student in Industrial Engineering Department at Marmara University since 2014. She has been assisting Assoc.Prof.Dr. Serol Bulkan and Assoc.Prof.Dr. Ozlem Senvar for more than one year during her study. She had an active role at Marmara University Faculty of Engineering (MUFE) Robotics Team. She was Communication Coordinator for two years at MUFE Robotics Team. She was a marketing intern at Happiana which is an entrepreneur company in Egypt, during 2 months with the help of AIESEC. Recently, she made a project with Assoc.Prof.Dr. Ozlem Senvar named Examination of Malignant Neoplasms and Revealing Relationships with Cigarette Consumption. This project has accepted and presented in [10<sup>th</sup> International Statistics Congress](#) in Ankara, Turkey. Her professional interests are operations research, scheduling, learning effects, simulation, operational management, and marketing.

**Serol Bulkan** is an Associate Professor in Industrial Engineering at the Marmara University, Istanbul, TURKEY. He earned B.S. in Management Engineering from Istanbul Technical University, TURKEY, Masters in Management Engineering from Istanbul Technical University, TURKEY and Operations Research from Florida Institute of Technology, USA, and PhD in Industrial Engineering from Cleveland State University, USA. He has published journal and conference papers. His research interests include manufacturing, simulation, optimization, scheduling, and networks.

**Hasan Can Tumantozlu** is graduated from Bornova Anatolian High School in 2014. Since 2014, he has been studying Industrial Engineering at Marmara University. Presently, he is an undergraduate student. He made a project about Turkish education system which has net schooling rate, number of students, schools, teachers, students per teacher in all schools in Turkey between 1997-2016 years at Statistics lecture. His Professional interests are operations research, crypto money, simulation, marketing, optimization of complex industrial systems.

**Elvan Merve Ak** is graduated from Bozuyuk Anatolian Teacher High School in 2014. She joined Industrial Engineering Department at Marmara University in 2014. She had an active role in Marmara Industrial Engineering Society between 2014 and 2017, also was an active member of Change Management Club at Marmara University in 2014. She served for marketing project named Seasons (detox beverage) in January 2017. She served for Election Forecasting for Old U.S. Elections with Markov Chain project which was conducted with Matlab language in May 2017. She took part in Operation Research and Industrial Engineering National Congress 2017 (YAEM'17) with her project named Analyses of the impacts of households by piped water system, toilet and bathroom facilities of the dwelling on the level of development of provinces of Turkey in July 2017. Her professional interests are operation research, production planning, simulation, manufacturing system and optimization, modelling of complex industrial systems, marketing and branding.

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