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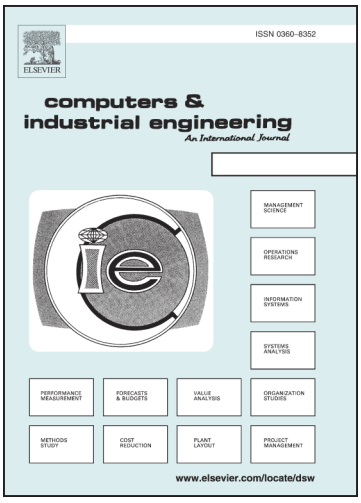


# Cooperation of advertising companies in social networks: A graph and game theory approaches

Ashkan Hafezalkotob, Maryam Khodabakhsh, Abbas Saghaei, Maryam Eshghipour

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# Cooperation of advertising companies in social networks: a graph and game theory approaches

Ashkan Hafezalkotob[a]*, Maryam Khodabakhsh[b], Abbas Saghaei[b], Maryam Eshghipour[c],

[a] *School of Industrial Engineering, Islamic Azad University, South Tehran Branch, Tehran, Iran*
[b] *Department of Industrial Engineering, Islamic Azad University, Science and Research Branch, Tehran, Iran*
[c] *School of Psychology and Educational Science, , Islamic Azad University, South Tehran Branch, Tehran, Iran*
**Corresponding author*

**Abstract.** Advertisement in companies that are active in social network is becoming a key success factor these days. The cooperative advertising enables companies to improve effectiveness of the advertisement efforts. In this research, we first present a mathematical model to quantify the profit of cooperation between the companies in a network. Afterwards, cooperative game theory methods such as Shapley value, Core-center, Least core, and τ-value are proposed to distribute benefits of the cooperative advertisement of the companies in the social networks. A numerical example of a simple social network with three advertising companies is presented to evaluate results of the models. It is shown that the profit obtained from coalition is greater than individual profits of the members. In this regard, fair allocation of the extra profit among companies ensures their satisfaction and long-term cooperation.

**Keywords:** Energy saving efforts; Governmental regulation; Game theory; Green supply chain; Sustainable development policy.

**Ashkan Hafezalkotob:**
E-mail address: a_hafez@azad.ac.ir, hafezalkotob@iust.ac.ir, ashkan.hafez@gmail.com
Tel: +98 912 778 5681,
Postal address: College of Industrial Engineering, Islamic Azad University, South Tehran Branch, Entezari Aly, Oskoui St, Choobi Brg, Tehran, Iran; Postal-Code: 1151863411,

**Maryam Khodabakhsh**
E-mail address: Mkhodabakhsh.aut@gmail.com
Tel: +98 912 406 9918,
Postal address: Department of Industrial Engineering, Islamic Azad University, Science and Research Branch, Tehran, Iran; Postal-Code: 14515/775,

**Abbas Saghaei:**
E-mail address: a.saghaei@srbiau.ac.ir
Tel: +98 912 778 5681,
Postal address: Department of Industrial Engineering, Islamic Azad University, Science and Research Branch, Tehran, Iran; Postal-Code: 14515/775,

**Maryam Eshghipour:**
E-mail address: Eghghipour@gmail.com
Tel: +98 912 689 0498,

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