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Resource allocation in networks via coalitional games

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Stellingen

behorende bij het proefschrift *Resource Allocation in Networks via Coalitional Games*

van Farshad Shams

- 1) Cooperative game theory provides an effective tool to address various problems in networking while fulfilling the promise of global efficient solutions. Cooperative game approaches achieve an improved performance compared to other solutions [Chapter 1].
- 2) Various attempts to standardize a protocol for radio resource management in OFDMA (a digital modulation and access scheme widely used in the current 4G and the future 5G wireless networks) have fallen into disuse largely because of their over-complexity and unfairness from the network service provider point of view [Chapter 2].
- 3) Fulfilling each user's demanded data rate exactly, according to a fair adaptive resource management criterion for an OFDMA wireless network, is possible through an algorithm based on coalitional game theory whose computational burden is the cheapest one in the literature [Chapter3].
- 4) Adopting a coalitional game theory based framework for cooperative power trading to minimize power loss during power transfer reduces the amount of power loss in smart power grids to 10% of that in traditional non-cooperative power distribution networks [Chapter 4].
- 5) In highly dense cellular networks, Device-to-Device communication, where a terminal is able to directly communicate with other terminals, is the best way to reduce the intra-cell interference.
- 6) Using very large arrays of antenna elements at base-stations is the best way to achieve optimal design for energy- and spectrum-efficient wireless networks at the cost of more expensive base-stations.
- 7) Microwave Power Transmission is the right alternative wireless technology for efficient power transmission to mobile devices.
- 8) If there is an index on the Integer column col1 of a table tbl1, the database engine processes the query "SELECT * FROM tbl1 WHERE col1 >= 4" much faster than "SELECT * FROM tbl1 WHERE col1 > 3".
- 9) An essential part of effective disaster management is teaching the public how to use Twitter effectively.
- 10) If a system doesn't have to actually work, it can meet any other criteria.