

1. Record Nr.	UNINA990006522280403321
Autore	Giovene, Mirella
Titolo	Crisi della socialità e condizione giovanile / Mirella Giovene
Pubbl/distr/stampa	Lecce : Schena Ed., 1986
Descrizione fisica	75-80 p. ; 24 cm
Disciplina	362.7
Locazione	FSPBC
Collocazione	BUSTA IX A 10
Lingua di pubblicazione	Italiano
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Estr. da "Giovani realta" 4(1969) n. 19.
2. Record Nr.	UNINA9910151959403321
Autore	Ji Bo <1982-, >
Titolo	Advances in multi-channel resource allocation : throughput, delay, and complexity / / Bo Ji, Xiaojun Lin, Ness B. Shroff
Pubbl/distr/stampa	[San Rafael, California] : , : Morgan & Claypool, , 2017
ISBN	1-62705-983-0
Descrizione fisica	1 online resource (132 pages) : illustrations (some color)
Collana	Synthesis lectures on communication networks, , 1935-4193 ; ; # 17
Disciplina	384.54524
Soggetti	Radio resource management (Wireless communications)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Part of: Synthesis digital library of engineering and computer science.
Nota di bibliografia	Includes bibliographical references (pages 103-114).
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Bibliography -- Authors' biographies.

Sommario/riassunto

The last decade has seen an unprecedented growth in the demand for wireless services. These services are fueled by applications that often require not only high data rates, but also very low latency to function as desired. However, as wireless networks grow and support increasingly large numbers of users, these control algorithms must also incur only low complexity in order to be implemented in practice. Therefore, there is a pressing need to develop wireless control algorithms that can achieve both high throughput and low delay, but with low-complexity operations. While these three performance metrics, i.e., throughput, delay, and complexity, are widely acknowledged as being among the most important for modern wireless networks, existing approaches often have had to sacrifice a subset of them in order to optimize the others, leading to wireless resource allocation algorithms that either suffer poor performance or are difficult to implement. In contrast, the recent results presented in this book demonstrate that, by cleverly taking advantage of multiple physical or virtual channels, one can develop new low-complexity algorithms that attain both provably high throughput and provably low delay. The book covers both the intra-cell and network-wide settings. In each case, after the pitfalls of existing approaches are examined, new systematic methodologies are provided to develop algorithms that perform provably well in all three dimensions.