

Networks

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Masterful unification of disparate fields and lessons from nature; derives comprehensible and realistic design principles. Point-to-point vs. hub-and-spoke. Questions of network design are real and involve many billions of dollars. Yet little is known about optimizing design - nearly all work concerns optimizing flow assuming a given design. This foundational book tackles optimization of network structure itself, deriving comprehensible and realistic design principles. With fixed material cost rates, a natural class of models implies the optimality of direct source-destination connections, but considerations of variable load and environmental intrusion then enforce trunking in the optimal design, producing an arterial or hierarchical net. Its determination requires a continuum formulation, which can however be simplified once a discrete structure begins to emerge. Connections are made with the masterly work of Bendsoe and Sigmund on optimal mechanical structures and also with neural, processing and communication networks, including those of the Internet and the Worldwide Web. Technical appendices are provided on random graphs and polymer models and on the Klimov index. EAN/ISBN : 9780511271748 Publisher(s): Cambridge University Press Format: ePub/PDF Author(s): Whittle, Peter

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