Optimizing Adaptive Modulation in Wireless Networks via Utility Maximization

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We investigate adaptive modulation using the network utility maximization framework. We derive new crosslayer optimal power and rate adaptation policies for several practical modulation schemes. The behavior of these crosslayer policies is found to differ from policies based on physical-layer optimization only. The multiple flow single link case is analyzed and optimal power and rate policies found. The multiple interfering link case is investigated and a numerical method presented to find optimal policies for this case.