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A Model for the Optimal Clustering of Combinatorial Objects

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Joint work with
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Gathering similar objects into groups is called clustering, and it is of great interest in many fields. The gist of our cluster optimization model is an inherent tradeoff: the cost of processing a set of objects decreases with the number of clusters, but to form each cluster incurs a substantial setup cost. This is the case, e.g., in the manufacture of printed circuit boards, and moreover combinatorial structures such as matchings, trees, paths, tours, and set coverings often underlie such practical instances. Thus we formulate a set partitioning model to cluster combinatorial objects, and propose a branch and price, or column generation, approach to the resulting large scale integer programs.

George G. Polak is an Associate Professor in the Department of Management Science and Information Systems at Wright State University in Dayton, Ohio. He holds a Ph.D. in Mathematics from Carnegie Mellon, and recently completed a Postdoctoral Fellowship in Operations Management, working with Professor Michael J. Magazine in the College of Business Administration at the University of Cincinnati. His research interests include supply chain modeling and optimization, network flows, machine scheduling and combinatorial optimization. His work has been published in a number of volumes and journals, including the *Naval Research Logistics Quarterly*, *Networks*, and the *European Journal of Operational Research*. He is active in the Institute for Operations Research and the Management Sciences (InfORMS), at both the local and national levels.