

Exact and approximation algorithms for designing optical access networks

Ashwin Arulselman

University of Strathclyde, UK

Abstract. In classical facility location problem, we are given a set of customers to be served by a set of potential facilities. It is often perceived as a clustering problem, where in, we seek clusters of customers each with a designated facility that minimizes the overall connectivity and location cost. We will present some recent work in this field with an application to optical access network design. In an optical access network, we have a set of customers with a demands that should be routed from their serving facilities. Optical cables need to be laid along these routes and this gets translated as costs. Due to the time and money involved in building such networks, its often deployed over a period of time and incremental solutions are often sought. The optical cables come with varying capacities and costs obeying economies of scale. We discuss several models and algorithmic solutions whose computational efficiency is demonstrated on real world and benchmark instances.