Title: Generating graphs

Author: Lucie Mohelníková

Department: Department of Applied Mathematics

Supervisor: Mgr. Zdeněk Dvořák, Ph.D., Computer Science Institute of Charles University

Abstract: The main topic of this thesis are the methods used to generate graphs from prescribed classes, especially graphs embeddable in surfaces. An important technique in this context is to generate the graphs by vertex decontractions. The identification of initial (irreducible) graphs is crucial for this technique. We give an overview of the results regarding the irreducible triangulations and quadrangulations of various surfaces, especially the surfaces of low genus (sphere, projective plane, Klein bottle). The main result of this work is the identification 21 irreducible triangulations which proves the result of Lawrencenko without using of information technology.

Keywords: irreducible, triangulations, torus