

# Abstract

The aim of the thesis is to study, develop and implement algorithms to compute invariants in singularity theory. A very important part is a parallel and very efficient implementation in computer algebra system SINGULAR. Three different and independent problems have been considered:

- The computation of the signature of a surface singularity defined by  $z^N + g(x, y) = 0$ .
- The computation of resolution graph and related invariants for plane curve singularities.
- The classification of simple function germs with respect to right equivalence in characteristic  $p > 0$  and the implementation of a classifier.