

Shellings from relative shellings

Russ Woodroffe

University of Primorska

`russ.woodroffe@famnit.upr.si`

Andrés David Santamaría-Galvis

University of Primorska

`andres.santamaria@famnit.upr.si`

It is frequently helpful to build complicated mathematical objects by breaking down into subobjects with simpler properties. In joint work with Andrés Santamaría-Galvis, we have shown how to usefully glue together shellings of relative simplicial complexes to construct a shelling of a large simplicial complex. Indeed, one of the main other ways of using the "divide and conquer" approach to build a shelling, vertex-decomposability, can be viewed as a consequence of our approach. One useful consequence is that our approach makes it relatively straightforward to find a shellable simplicial complex satisfying any of a variety of conditions on its facets that contain a free face. Another is an improved proof that the shellability decision problem is NP-complete.