

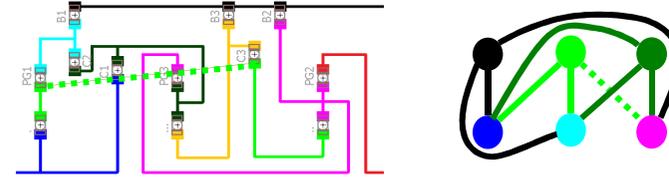
Challenge

Develop more efficient and robust algorithms for the company's new synthesis process for automatic transmission structures

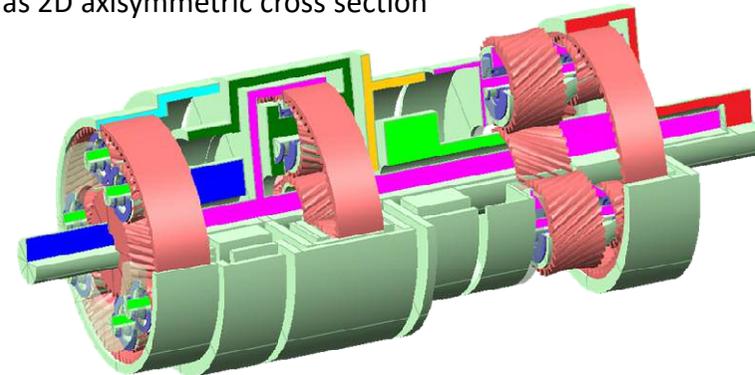
COMBINATORICS, GRAPH THEORY AND NONLINEAR OPTIMISATION IN AUTOMOTIVE INDUSTRY

Goals

- Efficiently generate a list of all possible unique structures
- Robustly test planarity of each candidate layout
- Efficiently optimise the planetary gear ratios to minimise a chosen error function



Layout of Non-planar candidate structure as 2D axisymmetric cross section



3D representation of Automatic Transmission Layout

Benefits

The company now has a more efficient generator of planetary gear structures and a robust planarity tester. The synthesis process can continue having avoided non-planarity (illustrative example shown above)