To construct every possible $d$-angulation of girth $d$ with $n$ nodes (based upon a counting argument by Bernardi and Fusy):

1. Construct every possible mobile that corresponds to such a graph. A mobile is the tree-like structure shown in the background figure that is embedded inside a $d$-angulation of girth $d$.
2. For every mobile, attempt to convert it to a graph that is equivalent to a $d$-angulation of girth $d$, discarding those for which this isn’t possible.
3. Transform each converted mobile into a $d$-angulation of girth $d$.

**Previous Work**

Existing algorithms have already been developed for:
- Triangulations R. Bowen and S. Fisk, 1967
- Quadrangulations G. Brinkmann, et. al., 2005
- Pentangulations M. Hasheminezhad, et. al., 2011
- ($d,d+2$)-angulations M. Jooyandeh

**Definitions**

- A planar graph is a set of points called nodes with (possibly directed) non-crossing lines called edges. Each bounded region is called a face.
- A $d$-angulation is a planar graph where each face is bounded by $d$ edges (for example, a pentangulation is a planar graph where every face is a pentagon).
- The girth of a planar graph is the length of the shortest cycle in the graph (that is, the path which starts and ends at the same node consisting of the smallest number of edges).
- A $d$-angulation of girth $d$ is a $d$-angulation with a girth of $d$.

**Future Work**

- Improve performance of the algorithm implementation so that it is viable to use for large $d$ and $n$.
- Prevent generation of isomorphic copies.
- Attempt to remove the “girth $d$” requirement for the algorithm to work.

**Algorithm**

1. Transform each converted mobile into a $d$-angulation of girth $d$.
2. Construct every possible $d$-angulation of girth $d$ with $n$ nodes (based upon a counting argument by Bernardi and Fusy):