Let T be a binary tree on n points. Collapse an internal edge to a point (thereby creating a node with three children) and then re-expand this node in the alternative possible way to create two nodes with two children each, giving a new tree T'. Such an operation is called a rotation; it is a common operation used in “balancing” trees. The rotation distance between two binary trees on n nodes is the minimum number of rotations required to convert one into the other. The authors show that the maximum rotation distance (taken over all pairs of trees on n nodes) is at most 2n-6 for \( n \geq 11 \); moreover, this bound is sharp for sufficiently large n. The proof proceeds by translating the problem into a problem on triangulations of polyhedra by tetrahedra. Particular examples are constructed using hyperbolic geometry.

Reviewer: D. Jungnickel

MSC:
- 51M20 Polyhedra and polytopes; regular figures, division of spaces
- 51M10 Hyperbolic and elliptic geometries (general) and generalizations
- 05C05 Trees
- 68R10 Graph theory (including graph drawing) in computer science

Keywords:
- rotation distance
- triangulations
- polyhedra
- hyperbolic geometry

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