An r-gentiling is a dissection of a shape into \( r \geq 2 \) parts that are all similar to the original shape. An r-reptiling is an r-gentiling of which all parts are mutually congruent. By applying gentilings recursively, together with a rule that defines an order on the parts, one may obtain an order in which to traverse all points within the original shape. We say such a traversal is a face-continuous space-filling curve if, at any level of recursion, the interior of the union of any set of consecutive parts is connected—that is, with two-dimensional shapes, consecutive parts must always meet along an edge. Most famously, the isosceles right triangle admits a 2-reptiling, which can be used to describe the face-continuous Sierpiński/Pólya space-filling curve; many other right triangles admit reptilings and gentilings that yield face-continuous space-filling curves as well. In this study we investigate which acute triangles admit non-trivial reptilings and gentilings, and whether these can form the basis for face-continuous space-filling curves. We derive several properties of reptilings and gentilings of acute (sometimes also obtuse) triangles, leading to the following...
conclusion: no face-continuous space-filling curve can be constructed on the basis of reptilings of acute triangles.

Intellectual Contribution:
Discipline-based Research

Zeitschriftentitel:
Discrete & Computational Geometry

Jahr:
2017

Monat:
12

Seiten:
1--30

Volltext / DOI:
http://doi.org/10.1007/s00454-017-9953-0

Print-ISSN:
0179-5376

Urteilsanmerkung / Urteilsbesprechung:
0

Key publication:
Ja

International:
Ja

Book review:
Nein

commissioned:
not commissioned

Professional Journal:
Nein

Interdisziplinarität:
Nein

Leitbild:

Ethics & Sustainability:
Nein

Occurences:
- Hochschulbibliographie > 2017 > Fakultäten > Wirtschaftswissenschaften > Lehrstuhl für Operations Research (Prof. Schulz)
- Einrichtungen > Forschungszentren > Operations Research Center (Prof. Schulz) > Refereed journal articles
- Einrichtungen > Fakultäten > Fakultät für Wirtschaftswissenschaften > Kompetenzfelder > Operations & Supply Chain Management > Lehrstuhl für Operations Research (Prof. Schulz) > Refereed journal articles
- Einrichtungen > Fakultäten > Fakultät für Mathematik > Zentrum Mathematik > M9 Kombinatorische Geometrie (Prof. Gritzmann) > Lehrstuhl für Operations Research (Prof. Schulz) > Refereed journal articles

entries: