

Glossary

Origami: the art of folding paper (or other surfaces) into three-dimensional shapes, usually from uncut squares or other continuous shapes.

Panel: the basic element of an origami that occupies the area bounded by creases or borders of the surface.

Developability: the ability of an origami to be unfolded into a flat sheet without overlapping or deformation of the panels

Flat-foldability: the ability of an origami to be folded into a flattened state of zero volume

Rigid origami: origami that can be folded while keeping all regions of the surface (e.g. paper) flat and all crease lines straight.

Right-hand thumb rule: A commonly used rule to determine direction of rotational quantities and associated vectors. Here we use it to determine the direction or sign of the turning angles corresponding to an axis of rotation placed along the crease.

Linkages: Mechanisms built from stiff bars connected by freely rotating joints (rigid links).

Bird's feet condition: A single-vertex crease pattern can be rigidly folded if, and only if, it contains a bird's foot, where a set of three creases of the same M/V assignment separated sequentially by angles strictly between 0 and 180 degrees, plus one additional crease of the opposite assignment.

Degree-4 vertices: Vertices delimited by 4 creases or 4 panels. Parallelogram-based origami is composed of degree-4 vertices.

Kirigami: The Japanese art of cutting and folding thin sheets (e.g. paper) from flat into three dimensional objects.

Seats: Grooves made by material removal for precise placement of joints.

Extensions: Appendages on the panels that can be placed and glued onto the matching seats.

Poisson's ratio: The negative of the ratio of transverse strain to longitudinal strain in a material subject to uniaxial loading.

Saint-Venant end effects: A small region near the point of load with non-uniform distribution of stress, where the effect of the exact form of the loading cannot be ignored.

Bloch wave reduction: A Discrete Fourier Transformation-based technique that enables efficient analysis of infinitely periodic lattice systems.

Crease: a mark left on the surface (e.g. paper) after a fold has been unfolded.

Crease pattern: the pattern of creases left on the surface after an origami has been unfolded.

Coloring: The crease pattern of a flat-foldable origami (e.g. crane) can be colored such that no two neighboring regions are assigned the same color while using as few colors as possible.

Foldcore: Sandwich structure consisting of thin stiff facesheets and thick, low density core made of an architected material (e.g. origami).