Symmetry in Shapes – Theory and Practice

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Course Webpage

• Tutorial slides
• Literature & references

Linked from:
• http://www.mpi-inf.mpg.de/~mwand/
State-of-the-Art Report from EG 2012

- Symmetry in 3D Geometry: Extraction and Applications
  Niloy J. Mitra, Mark Pauly, Michael Wand, Duygu Ceylan
  State-of-the-art Report EUROGRAPHICS 2012

- STAR Report webpage:

- Journal version:

Provides many more details
What we cover

Topics

• **Part I:** What is symmetry?
• **Part II:** Extrinsic symmetry detection
• **Part III:** Intrinsic symmetries
• **Part IV:** Representations & applications
• Conclusions, wrap-up
Part I

What is Symmetry?

- Symmetry in nature
- Formalization: Symmetry groups
- Symmetry is the absence of information

Dyugu / Mark
Extrinsic Symmetry Detection

• Geometric matching
• Types of symmetry
• Stages:
  - Feature selection
  - Aggregation
  - Extraction
• Example algorithms
Part III

Intrinsic Symmetry Detection

• Overview: intrinsic geometry
• Intrinsic symmetries, specific problems
• Overview of algorithms
• Spectral view
Part IV

Representations and Applications

• From pairwise matching to regularity
• Representations of symmetry
  ▪ Pairwise equivalence
  ▪ Permutation groups
  ▪ Transformation groups
• Applications based on this classification