

# Shape Machine

---

**A software application that bridges the gap between data representation of geometry and the shape that user sees in CAD**

Inventors at Georgia Tech have developed The Shape Machine, a software application that successfully meets the challenges that separate the visual rules from their symbolic counterparts. It can match or search any sub-shape (part) within a bigger shape that can be seen by users but is not existing in the database of CAD systems. The current prototype of the Shape Machine is a plug-in implemented in Python within the modeling software Rhinoceros 5 by Robert McNeel and Associates. The core concepts of Shape Machine include three main parts: a) a new implementation of the reduction rules; b) a new implementation of shape recognition for all shapes consisting of straight lines, arcs and their combinations under all Euclidean transformations; and c) a new implementation of a rule compiler of shape modification for all shapes consisting of straight lines, arcs and their combinations under all Euclidean transformations.

## Summary Bullets

- **General solution** — the sub-shape recognition module proposed is the first general solution to recognize sub-shape in a bigger shape
- **Efficient** — users can manipulate geometries instead of pixel-based images so there is no data training needed

## Solution Advantages

- **General solution** — the sub-shape recognition module proposed is the first general solution to recognize sub-shape in a bigger shape
- **Efficient** — users can manipulate geometries instead of pixel-based images so there is no data training needed

## Potential Commercial Applications

- Computer-aided architectural design (CAAD)
- Enhanced searching of geometric shapes for commercial and scientific applications

## Background and More Information

In the current CAD (computer-aided design) environment, there is a gap between data representation of geometry and the shape that user sees. Shapes in the current CAD systems are described as objects and this data representation is irrelevant from the visual perception. Designers can only manipulate the registered objects to create a design or edit a design. If users want to access some shapes which are not registered objects, there is no way to do it. This shortcoming of current CAD tools not only highly limits the creativity of designer, but also highly limits the possibility of inquiring visual models in other subjects.

## **Inventors**

- Dr. Athanassios Economou  
Professor – Georgia Tech Shape Computation Lab
- Tzu-Chieh Hong  
PhD Student – Georgia Tech Shape Computation Lab

## **IP Status**

:

## **Publications**

, -

## **Images**

Visit the Technology here:

[Shape Machine](#)

---

<https://s3.sandbox.research.gatech.edu//print/pdf/node/3429>