INTRODUCTION

The Olympic-sized stadium
The stadium is the 80,000-seat Olympic-sized facility that will be the premier international sports venue for the city of Hangzhou, and is currently the largest stadium planned for construction in China for the next ten years. The stadium’s exterior shell geometry draws from the serene flora iconography found on the banks of Hangzhou’s West Lake in order to create a powerful and unique image along the fast-growing Qian Tang riverfront. The stadium bowl program and structure are coordinated with the exterior shell to create a unique concourse and circulation experience.

Parametric Design
The designers leveraged advanced parametric scripts and modelling techniques to develop and optimize the exterior shell of the Hangzhou stadium. The steel shell and concrete bowl systems were coordinated and linked for stability and optimized steel use. Because the model was parametric, design changes could be made with an extremely short turnaround, eliminating the “build-test-discard” method common in traditional modeling.
MODELING PROCESS 1

Creating Base Ellipse

- Ellipse
- Area
- Point
- Curve
- Cluster
- Scale
MODELING PROCESS 2

Divide Curves and Numbering

- Divide Curve
- Cull Pattern
- Shift List
- Flatten Tree
- Graft Tree
- Point List
MODELING PROCESS 3

Connecting Points and Create Surface

- Merge
- Interpolate
- Ruled Surface
MODELING PROCESS 4

Create Truss

- Divide Curve
- Cull Pattern
- Shift List
- Flatten Tree
- Graft Tree
- Point List
- Deconstruct Brep
- Path Mapper
- Pipe
FINAL MODEL
Grasshopper Definition Components
VARIATIONS

ITERATION 01
ELLIPSE R1:130  ELLIPSE R2:100
DIVIDE NUMBER: 14
MAX HEIGHT: 30

ITERATION 02
ELLIPSE R1:130  ELLIPSE R2:130
DIVIDE NUMBER: 32
MAX HEIGHT: 30

ITERATION 03
ELLIPSE R1:130  ELLIPSE R2:200
DIVIDE NUMBER: 12
MAX HEIGHT: 30-72, 31-64, 15-28, 27-56