

## ***“Architectural Topologies: Visual Languages and Digital Applications”***

March 4, 2011  
12:30 - 2:00pm  
Room 7-431

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#### *Abstract:*

Visual computations provide the major machinery for design; instantiating, deleting, transforming and combining shapes, rapidly and erratically in design studio, or precisely and meticulously in formal design research, are the key mechanisms in both spatial synthesis and analysis. And still visual computations applied in computers often behave radically different from what the eyes perceive and expect – and mostly not for a better cause. An approach is outlined here to draw a link between the visual computations that architects delight at and the digital computations that computers are apt to. The proposed model consists of two intertwined parts: an underlying graph representation (topology) and a shape representation (geometry): any change in the topology of the model affects the geometry and any change in the geometry affects the topology of the model. The emergent descriptions, codenamed here as architectural topologies, cut across predefined topologies of given vocabularies of shapes and support generously two of the most important characteristics of visual computation: recursion and redescription. Three digital applications are presented in detail to illustrate the ideas discussed: a) Grape; b) P/LNP; and c) Sort Machine.

#### *Bio:*

Dr. Athanassios Economou is Associate Professor in the College of Architecture at the Georgia Institute of Technology. Dr. Economou teaching and research is in the areas of shape grammars, parametric design, computer aided design and discrete mathematics and design. Recent funded research projects include collaborative projects with TU Vienna /SWAP Architects on digital applications of shape grammars (Federal Courthouse Typology; 2010-2015); and a web-based database for the US Courthouses (CourtsWeb, 2007-2010). Design projects from his graduate studios at Georgia Tech have received prestigious awards and honorable mentions in international and national architectural competitions. He is the Director of the Shape Computation Lab at COA and the Georgia Tech Study Abroad Program on Architecture and Art in Greece and Italy. He has served on the technical committees for various associations for computer-aided design in architecture including ACADIA; CAADFutures; ECAADE; CAADRIA; SIGRADI and others, and he has been invited to lecture at several universities including MIT, Harvard, University of Michigan and others. Dr. Economou holds a Diploma in Architecture (1990) from the National Technical University (NTUA), Athens, Greece, a Masters of Architecture (1992) from the University of Southern California (USC), and a PhD in Architecture (1998) from the University of California, Los Angeles (UCLA).