Project Number	TQP107
Project Title	Implementing real-time subdivision surfaces for game applications
Project Description	Subdivision techniques are increasingly being used in modeling and animation. Subdivision surfaces have many advantages over traditional Non Uniform Rational B-spline (NURB) surfaces as it easily addresses the issues related to multi-resolution, refinement, scalability and representation of meshes. Many schemes already exist that take a coarse mesh and refine it using subdivision. However, they are cost intensive at higher levels of subdivision. The objective of this project is to propose and implement a real-time, cost-effective algorithm for creation of subdivision surfaces in modern games. The focus will be on modifying in real-time, partially or wholly, objects found in a game, like rocks, trees, buildings etc., while utilizing existing subdivision and/or LOD algorithms. The algorithm must work for large as well as small objects, allow for drastic simplification if needed and avoid visual inconsistencies such as popping.
Hardware/Software /References	• Visual Studio 2005 C/C++ • Xbox 360/PS3 development kits • XLEngine • Subdivision Surfaces http://www.ecclectica.ca/issues/2004/2/baumgarnter.asp • Subdivision Surface Theory http://www.gamasutra.com/features/20000411/sharp_01.htm • Level of Detail for 3D Graphics David Luebke et. al., Morgan Kaufmann, 2003 • Subdivision Surfaces in Computer Games http://www.dcs.shef.ac.uk/intranet/teaching/projects/archive/ug2001/pdf/u8cytc.pdf