Presentation Notes

CSCI-5229: Computer Graphics, Fall 2018 **James Watson, 105754866**
University of Colorado Boulder **Due: 2018-12-13**

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1. Demo
   (a) Purpose
   The purpose of this project
   (b) Features
   (c) Process
      i. Data Reading & Processing
      ii. Mesh Construction & UV-Matching
      iii. Event Loop
2. Cover things that you did in your project that I did not talk about in class
   - Processing mouse clicks in the camera frame
3. Cover "gotchas" - things that did not work initially, how you figured out the problem, and how you fix it
   (a) SDL2 function calls are all different from SDL1
   (b) There are two ways to handle keyboard input in SDL2, Keyboard State & Event Queue
      - Keyboard State
      - Event Queue
   (c) Difference between screen coordinates, orthogonal (flat) coordinates, and model (projection) coordinates
4. Cover stuff related to your project that has nothing to do with Computer Graphics
   - Delaunay Triangulation, courtesy of Paul Bourke
     – Paul Bourke is a big name in computational geometry, and he posts a lot code online
     – A common method to connect a collection of points in triangular mesh
     – It is the dual of Voronoi Cells
   - Hierarchical Collision Detection
     (a) Intersection of AABB and ray
     (b) Triangle-wise collision detection
     For each triangle
        i. Construct a plane from triangle and its normal
        ii. Get the intersection point between the ray and the plane
        iii. Compute winding number (point-in-polygon)
        This works for any closed polygon, polygon can self-cross
           A. New 2D reference frame with the query point at $(0, 0)$
           B. Follow segments CW around the polygon and count $+x$