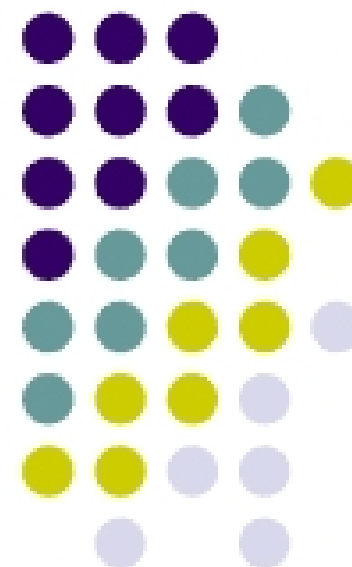


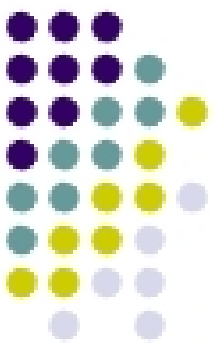
ME451

Kinematics and Dynamics of Machine Systems

Singular Configurations of Mechanisms 3.7
Dynamics of Planar Systems: Chapter 6
October 27, 2011

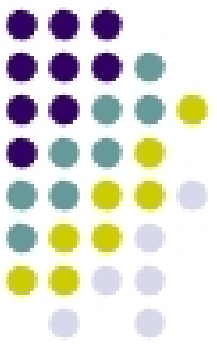


Before we get started...



- Last Time
 - Discussed Newton-Raphson method to solve nonlinear algebraic equations
 - Discussed the three stages of the Kinematics Analysis:
 - Position Analysis
 - Velocity Analysis
 - Acceleration Analysis
 - Mentioned why the Implicit Function Theorem is your friend
- Today:
 - Discuss "Singular Configurations of Mechanisms" (Section 3.7)
 - Start the "Dynamics Analysis" part of the course (Chapter 6)
- HW (due on November 3 at 11:59 PM): emailed to you this weekend
 - ADAMS
 - MATLAB
- Quick Remarks:
 - Exam Review on Nov. 2, starting at 6PM in room 1153ME
 - Note the room is the one next door

Singular Configurations



- What are “singular configurations”?
 - Abnormal situations that should be avoided since they indicate either a malfunction of the mechanism (poor design), or a bad model associated with an otherwise well designed mechanism
 - Singular configurations come in two flavors:
 - Physical Singularities (PS): reflect bad design decisions
 - Modeling Singularities (MS): reflect bad modeling decisions
 - Singular configurations do not represent the norm, but you must be aware of their existence
 - A PS is particularly bad and can lead to dangerous situations