

Summer Screws 2017, Monash University, Melbourne, 2-10 December

Schedule

Day 1, Saturday, 2 December: Introduction

12:00 Welcoming and registration
17:30 *Introductory Remarks*
18:30 Reception

Day 2, Sunday, 3 December: Twists and Wrenches

08:30 *Vector spaces, examples. Linear dependence and independence.*
10:30 *Dual spaces and scalar products. Systems of freedoms and constraints.*
12:30 Lunch break
14:00 *Types and classes of screw systems.*

Day 3, Monday, 4 December: Screw Systems

08:30 *Geometry of screw systems. Two-systems.*
10:30 *Three-systems. Four- and five-systems.*
12:30 Lunch break
14:00 *Invariant and persistent screw systems.*

Day 4, Tuesday, 5 December: K.W. Hunt and Screw Theory

08:30 *On the history of screw theory.*
09:15 *Remembering K.W. Hunt.* (K. Waldron, M. Pandy, P.R. McAree)
13:00 Lunch Reception at Orient East and (15:00) Visit to Royal Botanic Gardens Melbourne

Day 5, Wednesday, 6 December: Velocity Analysis

08:30 *Geometric and actuated constraints.*
10:30 *Velocity analysis of parallel mechanisms.*
12:30 Lunch break
14:00 *Input-output equations of closed loop mechanisms. Singularity Analysis.*

Day 6, Thursday, 7 December: The Special Euclidean Group

08:30 *Lie groups.*
10:30 *Lie algebras.*
12:30 Lunch break
14:00 *Rigid body motions. Bi-invariant metrics and Jacobian pseudoinverses.*

Day 7, Friday, 8 December: Elasticity

08:30 *Generalized coordinates and generalized forces.*
10:30 *Elasticity modelling with twists and wrenches.*
12:30 Lunch break
14:00 *Stiffness decomposition.*

Day 8, Saturday, 9 December: Dynamics

08:30 *Differentiation, acceleration. Momentum and inertia.*
10:30 *Equation of motion of a rigid body.*
12:30 Lunch break
14:00 *Dynamic models of serial robots. Inverse and forward dynamics of a kinematic tree.*

Day 9, Sunday, 10 December: Closing

08:30 Exam
10:30 Invited Lecture: *Motion generation and analysis*
12:00 Panel discussion, Q&A