

## SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

**Area: Control, Intelligent Systems & Robotics**

**Host: Prof Lee Tong Heng**

**Course Name: Introduction to Principles of Robot Motion**

**Textbook: Modern Robotics, by Lynch and Park, Chapter 2.**

<b>TOPIC</b>	:	<b>Configuration Space (2<sup>nd</sup> Lecture)</b>
<b>SPEAKER</b>	:	<b>Dr Xiong Xiaobin Postdoctoral Scholar, Dept of Mechanical &amp; Civil Engineering California Institute of Technology</b>
<b>DATE</b>	:	<b>Wednesday, 23 February 2022</b>
<b>TIME</b>	:	<b>10.00AM to 11.00AM</b>
<b>WEBINAR</b>	:	<b>Join Zoom Meeting <a href="https://nus-sg.zoom.us/j/4156763801?pwd=NUwzUWhwdlZlcGt3cmhyTzFld1V0QT09">https://nus-sg.zoom.us/j/4156763801?pwd=NUwzUWhwdlZlcGt3cmhyTzFld1V0QT09</a> Meeting ID: 415 676 3801 Passcode: 662108</b>

### ABSTRACT

In this short lecture, we will learn the fundamental concepts of rigid robot motion, including configuration, degrees of freedom, robot joints, constraints on robot motion (holonomic and nonholonomic), task space, work space, and topology representations. Various robot examples will be used throughout this lecture. In-class quizzes can be expected. After this lecture, we shall be able to understand the configuration space of any given robotic systems and problems, which builds the foundations towards understanding kinematics, dynamics, planning, and control of robotic systems in the latter parts of this course.

### BIOGRAPHY

Xiaobin Xiong is currently a postdoc scholar in the Department of Mechanical and Civil Engineering at the California Institute of Technology (Caltech). His research centers around bipedal locomotion on designing effective methodologies and theoretical foundations for solving the motion synthesis and control problems on the physical robots in real life. Broadly speaking, his interests are on the enhancement of the physical intelligence of legged robots to move and work in human society. He has studied and realized 3D underactuated bipedal walking, jumping, and walking on granular terrains on complex robotic hardware. He received his B.S. from Tongji University, Shanghai, China in 2013, M.S. from Northwestern University in 2015, and Ph.D. from Caltech in 2021, all in mechanical engineering. He has received several awards, including Amazon Fellowship in Artificial Intelligence, Simoudis Discovery Fund from Caltech, and the 2019 IROS RoboCup Best Paper Award.

<https://cde.nus.edu.sg/ece/highlights/events/>