

Robotics: Programming and Practice (3 Credits)

机器人入门：编程与实践

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Synopsis	This is an introductory course to expose students to the theory and practice of robotics. In the course project, students construct and program a simple robot to interact with its environment and perform basic tasks involving motion, sensory data and decision-making. The course is divided into three parts. The first part is a brief introduction of robotics, including history and current developments. Students carryout experiments with a fish-like robot and a somatosensory control of humanoid robot developed by the in-house team. The second part is concerned with programming practice with various types of hardware for robot, including switch, LED light, buzzer, sensor and actuator. The last part is concerned with robotic design and construction, and innovative application demo. Students are required to build a simple robot aimed at solving some real problems.		
Offering	2018 July Semester (Julmester)		
Audience	All Undergraduate and Year 1 Graduate Students		
Classroom	Room TBA, Teaching Bldg. No. TBA, Peking University		
Frequency	<u>Class</u> : 1-4 PM, M-F, July 2–20, 2018	<u>Final Exam</u> : No Final Exam	<u>Total Contact Hours</u> : 45
Objectives	<p>The two goals of the course are as follows:</p> <ul style="list-style-type: none"> <li>to acquire a comprehensive and systematic understanding of robotics and their applications in the real world</li> <li>to learn how to design and construct a robot prototype with a defined purpose.</li> </ul>		
Topics	<ol style="list-style-type: none"> <li>Basic knowledge of robotics</li> <li>History of robotics</li> <li>Current development of robotics</li> <li>Fish-like underwater robot</li> <li>Humanoid robot</li> <li>Somatosensory control</li> <li>Graphic programming in Scratch</li> <li>Graphic programming with hardware</li> <li>Robot design and construction</li> <li>Robot application demonstration</li> </ol> <p>Note: At the end of the course, a robot competition will be held and all students are welcome to participate. The outcome of the competition will not have any bearing on your final grade.</p>		
References	<ol style="list-style-type: none"> <li>G. Xie, et. al., <i>Robot Introduction</i>, Peking University Press, Beijing(2017)</li> <li><i>Robotics</i>, Wiki Online Book, <a href="https://en.wikibooks.org/wiki/Robotics">https://en.wikibooks.org/wiki/Robotics</a></li> <li><a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a></li> <li><a href="http://www.kenrobot.com/">http://www.kenrobot.com/</a></li> </ol>		
Grading	Programming Practice (Individual)	40%	
	<ul style="list-style-type: none"> <li>Project Presentation 20%</li> <li>Project Report 20%</li> </ul>		
	Final Project Assessment (Team)	50%	
	<ul style="list-style-type: none"> <li>Project Presentation 15%</li> <li>Class Presentation 15%</li> <li>Project Report 20%</li> </ul>		
	Attendance & Discussion	10%	
	<b>Total</b>	<b>100%</b>	