A fast introduction to Robotics v 2.0

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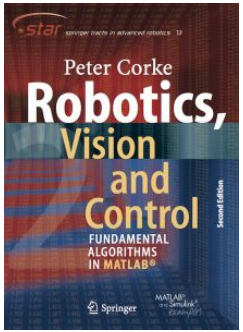
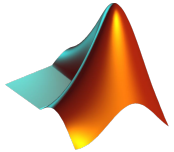
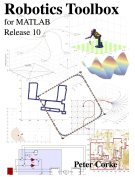
How to get started



Basic knowledge

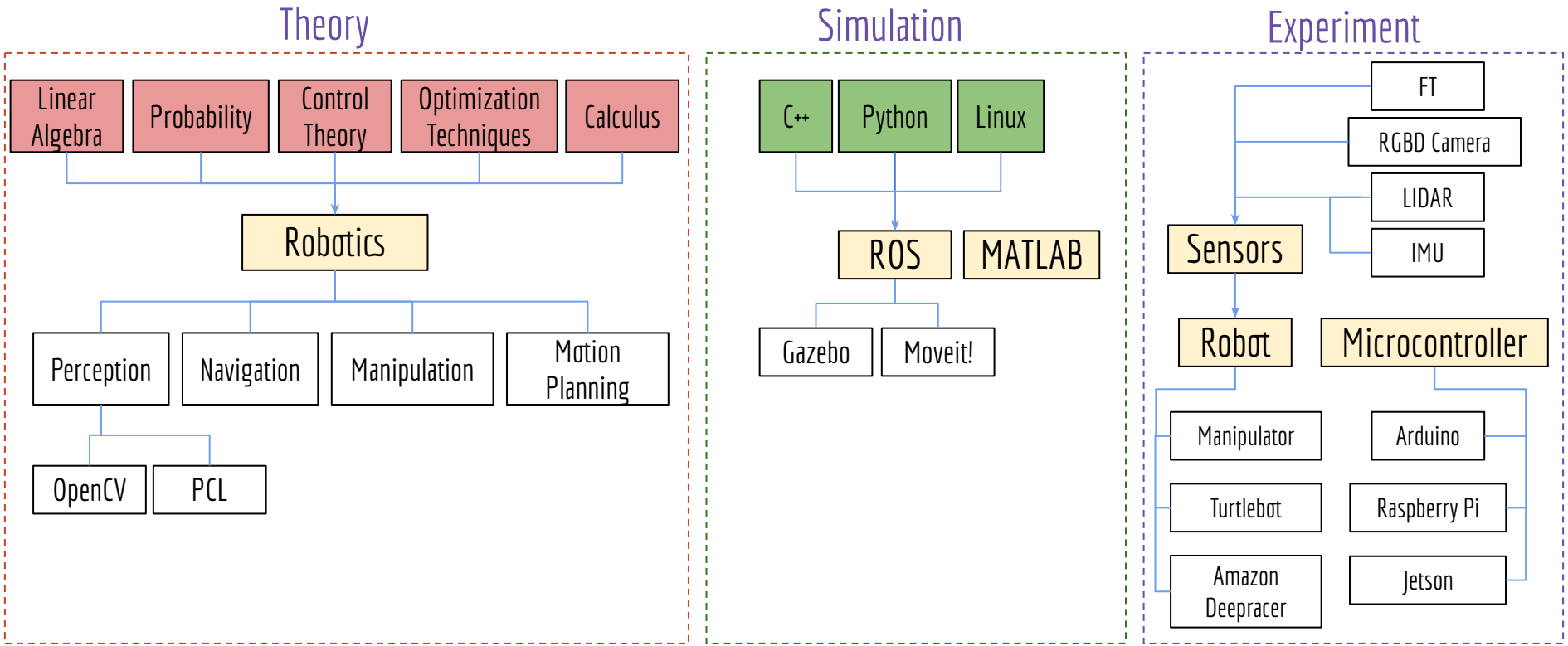




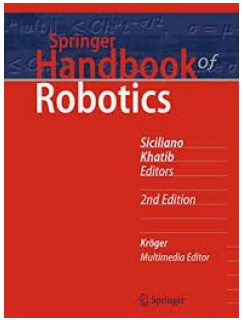
Software

Hardware

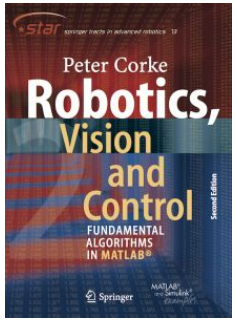
Robotics Chart



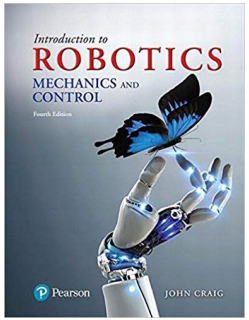
Resources -Books

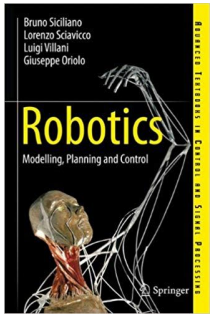


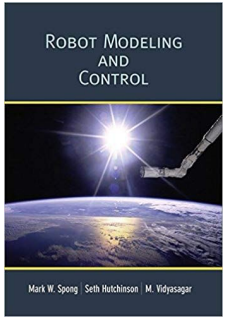
Bible of robotics

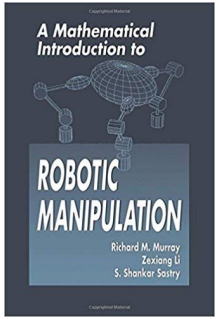


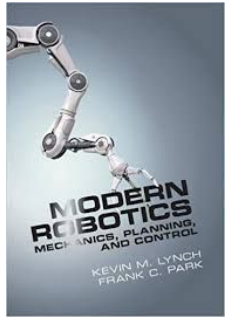
Easy to understand



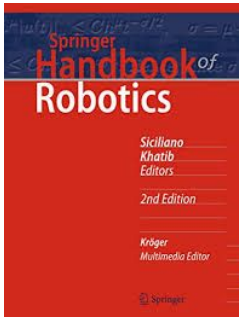








Resources -Online

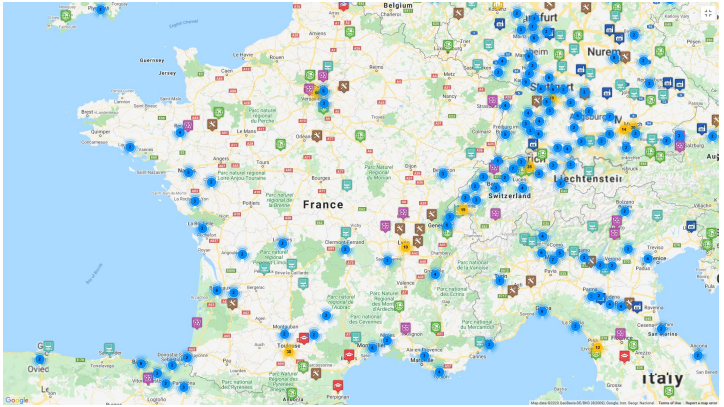


Bible of robotics

QUT ROBOT ACADEMY

IEEE Robotics & Automation Society

IEEE Robotics and Automation Society



Map of robotics related institutions from The Robot Report

Resources -Online

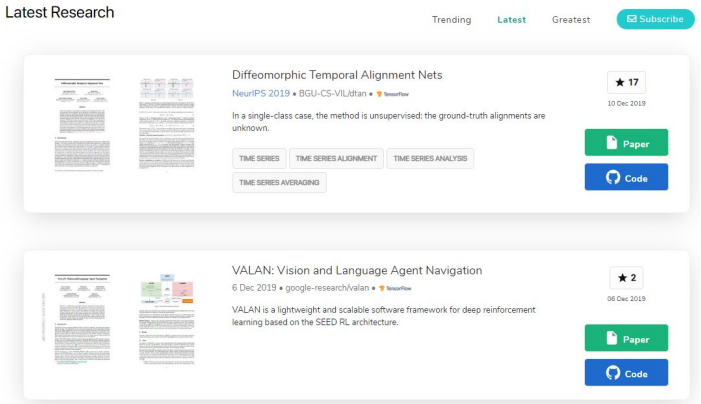
1. EU Robotics — Subscribe to the mailing list for deadlines / workshops / jobs / PhD calls / Post-docs
2. Robotics Worldwide — Subscribe to the mailing list for deadlines / workshops / jobs / PhD calls / Post-docs
3. Euraxess — Research openings in robotics in Europe
4. Academic Positions — Careers in robotics
5. Masters Portal — To search for masters in robotics
6. Phd portal — To search for PhD openings in robotics
7. AI for Robotics — Subscribe to google group on AI in Robotics

To find papers -

1. Contact the first author
2. Laboratory websites
3. Google Scholar

To find codes -

1. Contact the first author
2. paperswithcode.com



Foundations

International body on robotics

Websites to keep yourself updated regarding latest developments in robotics

1. Elsevier Labs
2. ABB Corporate Research Center
3. Robohub
4. Weekly robotics

Competitions

Events

EUROPEAN ROBOTICS FORUM
Brought to you by SPARC

ROBOTICS SUMMIT & EXPO

TERRINet
The European Robotics Research Infrastucture Network

amazon RE:MARS

ROBOTT NET robot technology transfer network

EXPERTDAYS SERVICE ROBOTICS

Conferences and Journals

Conferences -

1. IEEE IROS
2. IEEE ICRA
3. R:SS
4. IEEE Conference on Systems,Man and Cybernetics
5. IEEE Humanoids
6. IEEE ROBIO
7. RO-MAN
8. CASE

Journals -

1. International Journal on Robotics Research
2. IEEE Transactions on Robotics
3. Robotics and Computer Integrated Manufacturing
4. Robotics and Autonomous Systems
5. IEEE Robotics and Automation Letters (RA-L)

References - Basics

1. Control Theory / Probability / Programming
2. Basic understanding
    a. Probability for Robotics - Probabilistic Robotics
    b. Solutions to Probability for Robotics - Solutions
    c. Linux for ROS
    d. C++ for ROS
    e. Python for ROS
3. Theory
    a. Control Theory - Modern Control by Ogata
4. YouTube channels
    a. Control Bootcamp by Steve Brunton
5. Code repository
    a. Github
6. Tools
    a. Stack Exchange

References - Robotics

1. Basic understanding - Robotics, Vision and Control 2e by Peter Corke
2. Theory
    a. Robotics, Vision and Control 2e by Peter Corke
    b. Springer Handbook of Robotics
3. Notes - Robotics Notes by Motoji Yamamoto
4. Mathematics - Robotics, Vision and Control 2e by Peter Corke
5. Online course
    a. Roboticscourseware.org
    b. QUT Robot Academy - by Peter Corke
6. University course
    a. Course by Prof. Alessandro De Luca (Sapienza Università di Roma)
    b. Politecnico di Milano
    c. Course by Prof. Oussama Khatib (Stanford University)
    d. University of Naples
7. Ready to eat examples - Robotics, Vision and Control 2e by Peter Corke
8. Getting started immediately - Peter Corke Toolbox + Matlab
9. Books
    a. Refer to the books list at https://petercorke.com/resources/interesting-books/
10. Other curated lists
    a. https://github.com/jslee02/awesome-robotics-libraries
    b. https://github.com/ahundt/awesome-robotics
    c. https://github.com/LyOn/awesome-robotic-tooling

Tools

1. Visualization of Frames
    a. Peter Corke Toolbox
2. Roll-pitch-yaw visualization
    a. Peter Corke Toolbox
3. DH parameters visualization
    a. Peter Corke Toolbox
4. Jacobian calculation
    a. Symoro
5. Robot simulators
    a. RoboDK
    b. Gazebo
    c. Peter Corke RCV
    d. MATLAB RTB
    e. Robo Analyzer
6. 3D CAD Modeling Software
    a. CATIA
    b. SolidWorks
    c. FreeCAD
    d. TinkerCAD
7. Dynamics Modeling
    a. ADAMS
    b. MATLAB Simscape Multibody
8. Visualization Tools
    a. GNU Plot C++ for graphs
    b. Plot Juggler -ROS Topics
    c. rqt_plot - ROS Topics
    d. RVIZ
    e. Xmind - Mind maps
    f. draw.io - Online diagrams
    g. Microsoft One Note
    h. Tikz - curated list
    i. Python Matplotlib - graphs
    j. MATLAB GUI

References - ROS (Robot Operating System)

1. Basic understanding - ROS.org
2. YouTube channels
   a. Programming for Robotics (ROS) by ETH Zurich
3. Online course
   a. The Construct: ROS
   b. Edx ROS
4. Ready to eat examples
   a. Follow the examples on ROS Tutorials
   b. https://github.com/qboticslabs/ros_robotics_projects
5. Getting started immediately - MATLAB Robotics Toolbox
6. Books
   a. Robot Operating System by Anis Koubaa
   b. ROS Robotics Projects by Lentin Joseph
   c. Mastering ROS for Robotics Programming
   d. Learning Robotics using Python
7. ROS jobs - The construct sim ros-jobs

References - Navigation

1. Basic understanding - Robotics, Vision and Control 2e by Peter Corke
2. Theory - Refer to the books below
3. YouTube channels
    a. SLAM Course by Cyrill Stachniss
4. Online course
    a. Udacity - School of autonomous systems
    b. Coursera - Self driving cars
5. Ready to eat examples - Robotics, Vision and Control 2e by Peter Corke
6. Getting started immediately - Peter Corke Robotics Toolbox + Matlab
7. Books
    a. Probabilistic Robotics
    b. Principles of Robot Motion: Theory, Algorithms, and Implementations
    c. Introduction to Autonomous Mobile Robots
    d. Computational Principles of Mobile Robotics
8. Tools
    a. AtsushiSakai/PythonRobotics: Python codes for robotics algorithms.
    b. The Construct: ROS
    c. Carla - Open-source simulator for autonomous driving research
    d. ROS Navigation
    e. KITTI dataset
    f. ETH Zurich - Build your own mobile robot
9. Others
    a. Wevolver 2020 autonomous vehicle technology report

References - Machine Learning

1. Mathematics
   a. Book - Mathematics for Machine Learning by Deisenroth
   b. Book - The Hundred-Page Machine Learning Book by Andriy Burkov
2. YouTube channels
   a. Bloomberg ML by David Rosenberg
   b. Machine Learning by Andrew Ng
   c. Deep Learning by Nando de Freitas
3. Online course
   a. End-to-end machine learning
   b. Machine Learning Mastery
   c. Deep Learning AI
   d. NVIDIA Deep Learning Institute
4. Professionals
   a. Machine Learning for Marketers by Steve Nouri
   b. Introduction to Deep Learning Business Applications for Developers
5. Books
   a. Deep Learning by Ian Goodfellow
6. Getting started immediately
   a. Book - MATLAB Deep Learning by Phil Kim
   b. MATLAB Deep Learning Toolbox
7. Tools
   a. OpenAI
   b. MATLAB Deep Learning Toolbox
   c. Made with ML
   d. Papers with code
8. LinkedIn
   a. Steve Nouri
   b. Brandon Rohrer
   c. Vincent Boucher
9. Other curated resources
   a. https://madewithml.com/topics/
   b. https://blog.re-work.co/top-ai-resource-directory/
   c. http://www.machinelearning.org/links.html
   d. https://www.datasetlist.com/

References - Reinforcement Learning

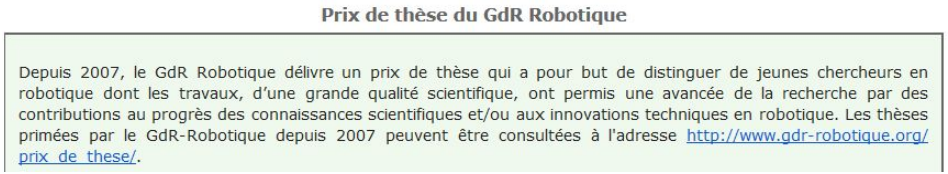
1. Mathematics
    a. Book - Reinforcement Learning by Richard Sutton
    b. Book - Algorithms for Reinforcement Learning
    c. Book - Reinforcement Learning-An Introduction
    d. Book - Reinforcement Learning-Marco Wiering
2. YouTube channels
    a. RL lectures by David Silver (DeepMind)
3. Online course
    a. Udacity Reinforcement Learning course by Georgia Tech
    b. Simoninithomas deep reinforcement learning course
    c. Berkeley deep reinforcement learning
4. Ready to eat examples
    a. Hands-on reinforcement learning with Python - Sudharsan Ravichandran
    b. Reinforcement Learning Python - Abhishek Nandy
    c. RL Toolbox - MATLAB
5. Getting started immediately
    a. Book-Reinforcement Learning
    b. Book-RL with Python
    c. Book-Practical RL
6. Tools
    a. Spinning Up in Deep RL!
    b. RL Toolbox - MATLAB
    c. Open AI
    d. Open Source RL
    e. http://busoniu.net/repository.php
7. Seminars
    a. RL Theory Seminars

References - Computer Vision

1. Online course
    a. OpenCV.org
    b. Pyimagesearch by Adrian Rosebrock
    c. Point Cloud Library (PCL)
2. Ready to eat examples - Peter Corke
3. Getting started immediately - Peter Corke Toolbox + Matlab

PhD Awards

1. European Young Researchers Award
2. Georges Giralt Phd Thesis Award
3. Award by Clermont Ferrand
4. Award by GDR Robotique



Prix de thèse du GdR Robotique

Depuis 2007, le GdR Robotique délivre un prix de thèse qui a pour but de distinguer de jeunes chercheurs en robotique dont les travaux, d'une grande qualité scientifique, ont permis une avancée de la recherche par des contributions au progrès des connaissances scientifiques et/ou aux innovations techniques en robotique. Les thèses primées par le GdR-Robotique depuis 2007 peuvent être consultées à l'adresse http://www.gdr-robotique.org/prix_de_these/.

Suggestions ? Feedback ?

Email to harshmaithani09@gmail.com

Thank you