计算机视觉
Computer Vision

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钉钉课程群

课程简介

- 本课程网址：
  - 学在浙大
  - http://course.zju.edu.cn

主要内容

- 课程简介
  - 课程设置情况
  - 相关课程
  - 课程网址
  - 参考资料
  - 开发工具
  - 成绩评定

课程简介

- 课程设置情况：
  - 目标：引导学生进入计算机视觉领域的研究
    - **基础理论**
    - **经典算法**

      从视觉成像与表达、低层视觉、中层视觉、高层视觉等多个角度阐述计算机视觉的重要方法
    - **最新应用**

课程简介

- 课程设置情况：
  - 部分国外大学的计算机视觉课程：
    - MIT
      - By **Antonio Torralba**
      - **6.869** Advances in Computer Vision
    - Stanford
      - By **Fei-Fei Li**
      - **CS 131** Computer Vision: Foundations and Applications
    - Berkeley
      - By **Jitendra Malik**
      - **CS 280** Computer Vision: http://www-inst.eecs.berkeley.edu/~cs280/sp15/
    - UIUC
      - By **Derek Hoiem**
      - **CS 543** Computer Vision https://courses.engr.illinois.edu/cs543/sp2015/
    - CMU
      - By **Martial Hebert**
      - **16-720** Computer Vision http://16720.courses.cs.cmu.edu/
    - UCLA, USC, UCSD, Caltech, Maryland……





课程简介

- 相关课程：
  - 数学基础课程：
    - **线性代数、概率统计、数值计算与优化方法**
    - 投影几何、微分几何
  - 专业基础课程：
    - **图像处理**
    - **模式识别与机器学习**
    - **计算机图形学**
      - 计算几何
  - 基本分析工具和数学模型
    - 信号处理方法: FFT, wavelets, filtering (Kalman, particle)…
    - 子空间方法: PCA, LDA, ICA, LLE, ISOMAP, LLP…
    - 贝叶斯推理方法: EM, MCMC, ….
    - 图模型：HMM, Bayesian network (BN)/dynamic Bayesian network (DBN), Gibbs random field (GRF), Markov random field (MRF), …
    - 其他机器学习方法: SVM/Kernel machine, Boosting/Adaboost, NN/Regression, …

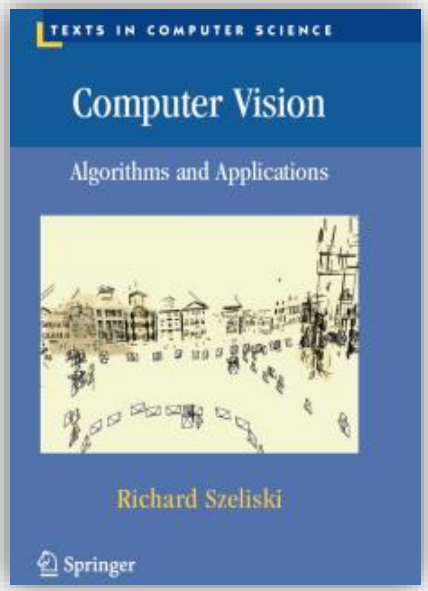
课程简介

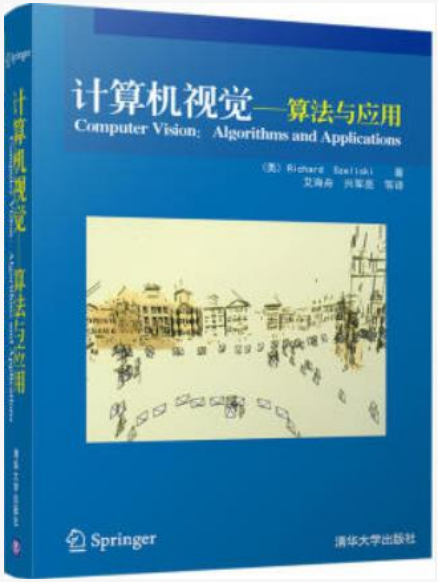
Textbook-1

《Computer Vision: Algorithms and Applications》

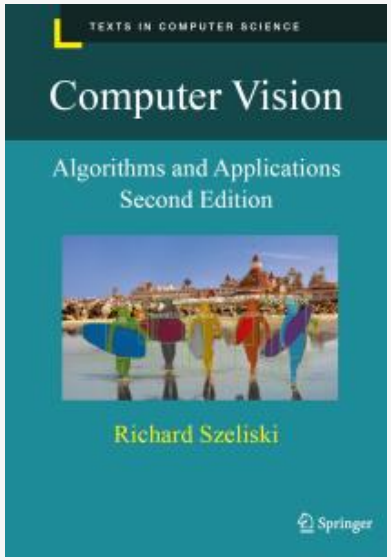
Richard Szeliski, Microsoft Research → The University of Washington

http://szeliski.org/Book/





清华大学出版社

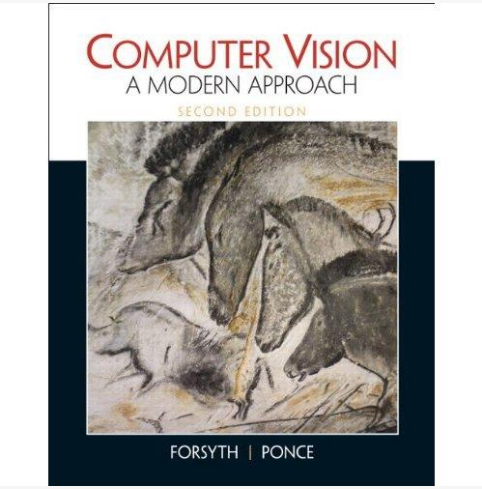


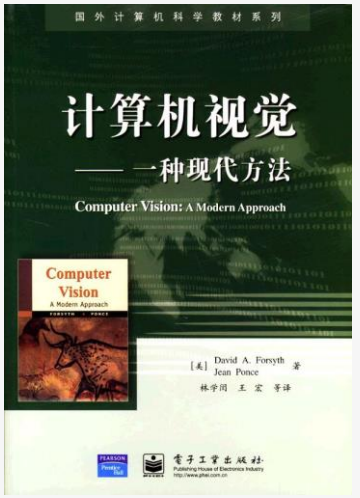
2022 edition

课程简介

- 主要参考书：
  - 《**Computer Vision: A Modern Approach**》，David A. Forsyth, Jean Ponce 著．第一版@2004　第二版@2011

第二版：http://luthuli.cs.uiuc.edu/~daf/CV2E-site/cv2eindex.html





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- 主要参考书：

《Computer Vision: Models, Learning, and Inference》

by Cambridge University Press

© 2012 Simon J.D. Prince, University College of London

- http://www.computervisionmodels.com

课程简介

- 其他参考书：
  - Multiple View Geometry in Computer Vision, Richard Hartley and Andrew Zisserman, Cambridge University Press, 2000
  - 计算机视觉中的多视图几何，安徽大学出版社
    - http://users.rsise.anu.edu.au/~hartley/

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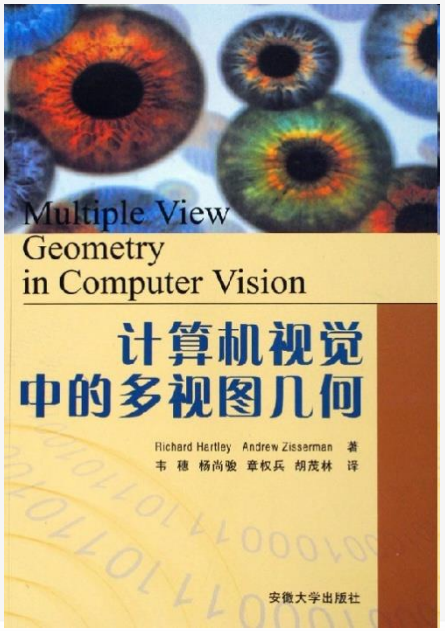
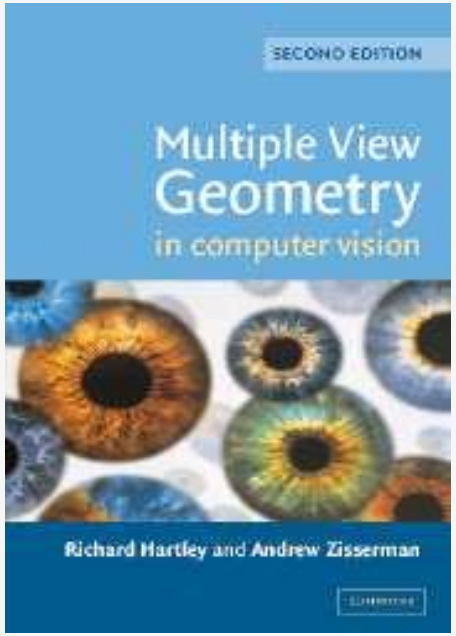
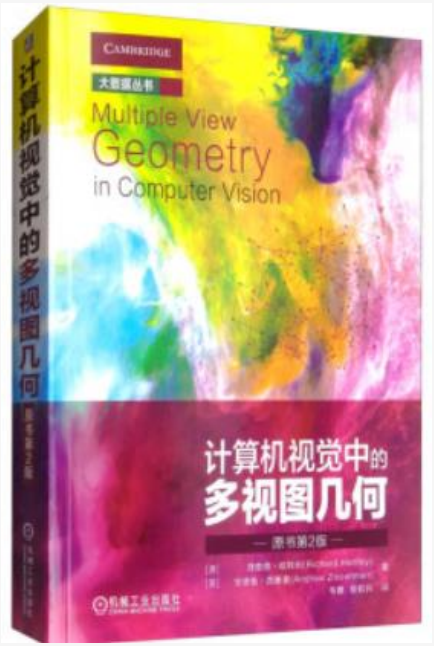




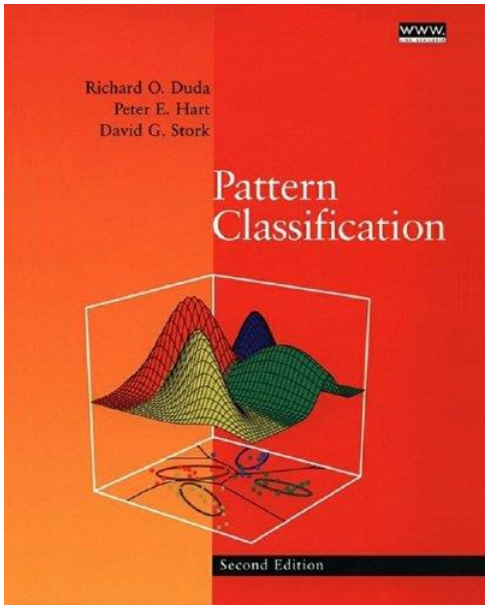


关于课程

- 参考教材

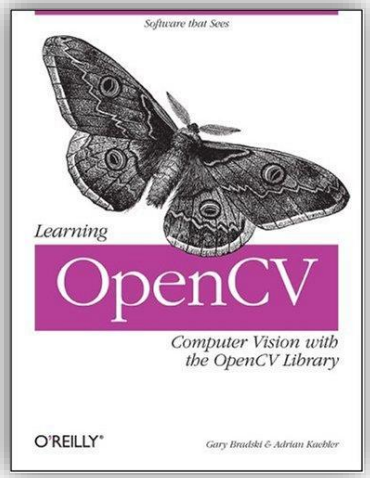
《Pattern Classification (2nd Edition)》

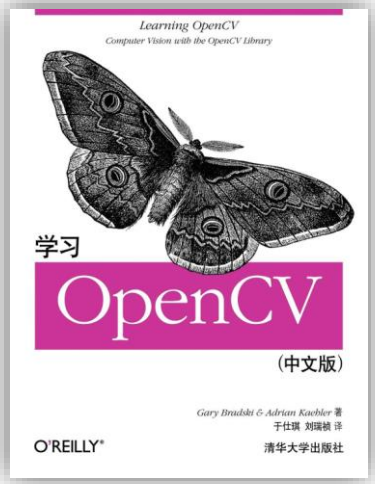
© 2000, Wiley-Interscience, Duda, Hart and Stork

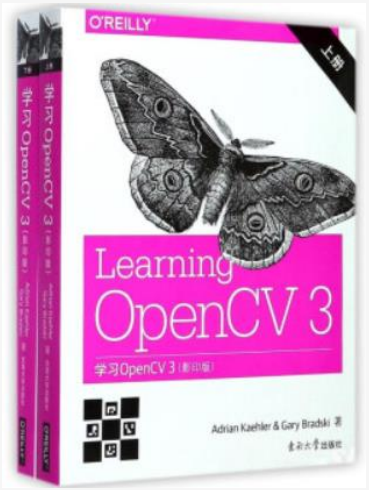


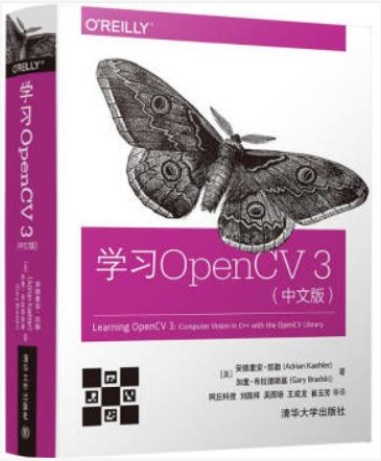
课程简介

- 主要参考书：
  - Gary Bradski, Adrian Kaehler, "Learning OpenCV"
  - 于仕琪 刘瑞祯译, 学习OpenCV(中文版), 清华大学出版社
  - Adrian Kaehler, Gary Bradski, "Learning OpenCV 3"









课程简介

- 参考资料：
  - IEEE Transaction on Pattern Analysis and Machine Intelligence (**TPAMI**)
  - International Journal of Computer Vision (**IJCV**)
  - IEEE Transaction on Image Processing (**TIP**)
  - IEEE Computer Society International Conference on Computer Vision and Pattern Recognition (**CVPR**)
  - IEEE International Conference on Computer Vision (**ICCV**)
  - European Conference on Computer Vision (**ECCV**)
  - The AAAI Conference on Artificial Intelligence (**AAAI**)
  - The International Joint Conference on Artificial Intelligence (**IJCAI**)
  - The Conference on Neural Information Processing Systems (**NeurIPS**)
  - The International Conference on Learning Representations (**ICLR**)
  - IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**)
  - **Nature Machine Intelligence**

课程简介

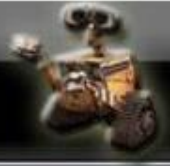
- 参考资料：
  - 其他国际期刊和会议论文：
    - Computer Vision and Image Understanding (CVIU)
    - Image and Vision Computing (IVC)
    - Pattern Recognition (PR)
    - Pattern Recognition Letters (PRL)
    - The British Machine Vision Conference (BMVC)
    - Int. Conf. on Pattern Recognition (ICPR)
    - IEEE Int'l Conf. on Image Processing (ICIP)
    - Asian Conference on Computer Vision (ACCV)
    - .....

课程简介

- 参考资料：
  - **Google Scholar**
  - Google Search
  - IEEE Digital Library

  - 作者个人主页

  - **https://www.thecvf.com/**
  - 近年的ICCV&CVPR： https://openaccess.thecvf.com/menu



课程简介

- **Grading：**
  - Homework1（10%）
    - 使用OpenCV
  - Homework2（15%）
  - Homework3（15%）

【Deadline:迟交按 80%计分】

【Final: Team work, ≤ 3， Weight：1.0、0.9、0.8 】

  - Final Project（50%）
  - Final Project Presentation （10%）
    - 开学后、形式待定、自愿报名