

Welcome to
Computer Vision
Week #1 - Lecture

Agenda

Week #1 - Computer Vision - Lecture Introduction to Computer Vision

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Course overview

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Course organization

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Course importance

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Introduction to Enterprise Architecture

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Real-Life Computer Vision Applications

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Real-Life Computer Vision Applications

Welcome to Computer Vision!

Thank you for your enrollment to this class!

Course Codes

Class codes: INF 324

Google classroom code: jwigt8y

SDU 2018: Computer Vision INF 324



Zhomart Aldamuratov

Course goal and objective

This course aims to introduce fundamentals of key computer vision concepts

Course will cover, mainly, board overview of computer vision and its purpose & importance

Course goal and objective

This subject also focuses on enlargement of students' acquaintance on practices more deeply through class work and assignments

Course goal and objective

The main goal of this course is to strengthen students' knowledge and practice by:

- Image processing for computer vision
- Camera Models and Views
- Image Features

Course goal and objective

The main goal of this course is to strengthen students' knowledge and practice by:

- Lighting
- Image Motion
- Tracking

Course goal and objective

The main goal of this course is to strengthen students' knowledge and practice by:

- Classification and Recognition
- Useful Methods
- Human Visual System

Course goal and objective

At the end of course, I hope you will be solve real-life computer vision problems

Course goal and objective

Prerequisites:

- Knowledge about data structures, linear algebra, calculus (vector calculus), basic probability
 - at least programming skills in one well known programming language

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Course details:

Academic Year 2017-2018

- Spring 2018
- 15 weeks (January 2018 - May 2018)
- 4 hours in a week
 - o Lecture 2 hours
 - o Practice 2 hours

Course details:



Instructor: Jomart Aldamuratov

- e-mail: zhomart.aldamuratov@sdu.edu.kz

- +4 years experience in Education (KBTU, SDU)

- ~10 years experience in IT (Toyota Motor Kazakhstan LLP - Almaty, Kazakhstan - 2008 - 2018)

- Master of Computer Science (Ritsumeikan University, Kyoto, JAPAN - 2005-2007)

Course details:

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	ES	MP
Lectures	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		15
Practices	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		15
Assignments			2		2		2			2		2		2			12
Midterm Exams							10								8		18
Final Exam																40	40
MP for EC	2	2	4	2	4	2	14	2	2	4	2	4	2	4	10	40	
TOTAL																	100

MP-Max. Points for semester; MP for EC-Max. Points for each class; ES-examination session;

Course details:

SDU standard Academic Policy is used

Please, see the Syllabus CV 2018

Course details:

Modules

- Module 1 - Image Processing for computer vision
- Module 2 - Camera Models and Views
- Module 3 - Image Features

Course details:

Modules

- Module 4 - Lighting
- Module 5 - Image Motion
- Module 6 - Tracking

Course details:

Modules

- Module 7 - Classification and Recognition
- Module 8 - Useful Methods
- Module 9 - Human Visual System

Course details:

References

- Udacity Free Course - Introduction to Computer Vision by Georgia Tech
- Forsyth & Ponce, Computer Vision: A Modern Approach (2nd Edition), Prentice Hall, 2011

Course details:

References

- Richard Szeliski, Computer Vision: Algorithms and Applications
- Several articles related to topics and online materials

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Real-Life Computer Vision Applications

Computer Vision:

Computer Vision will change the way that we see the world

Computer Vision Use Case & Benefits

- Public Safety and Home Security
- Authentication and Enhanced Computer-human interaction
- Content Management and Analysis



Computer Vision Use Case & Benefits

- Autonomous Driving
- Medical Imaging
- Manufacturing Process Control



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Computer Vision:

Computer Vision allows machines to identify people, places, and things in images with accuracy at or above human levels with much greater speed and efficiency.



Computer Vision:

Often built with deep learning models, it automates extraction, analysis, classification and understanding of useful information from a single image or a sequence of images.



Computer Vision:

The image data can take many forms, such as single images, video sequences, views from multiple cameras, or three-dimensional data.



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Real-Life Computer Vision Applications

Real-Life Computer Vision Applications |

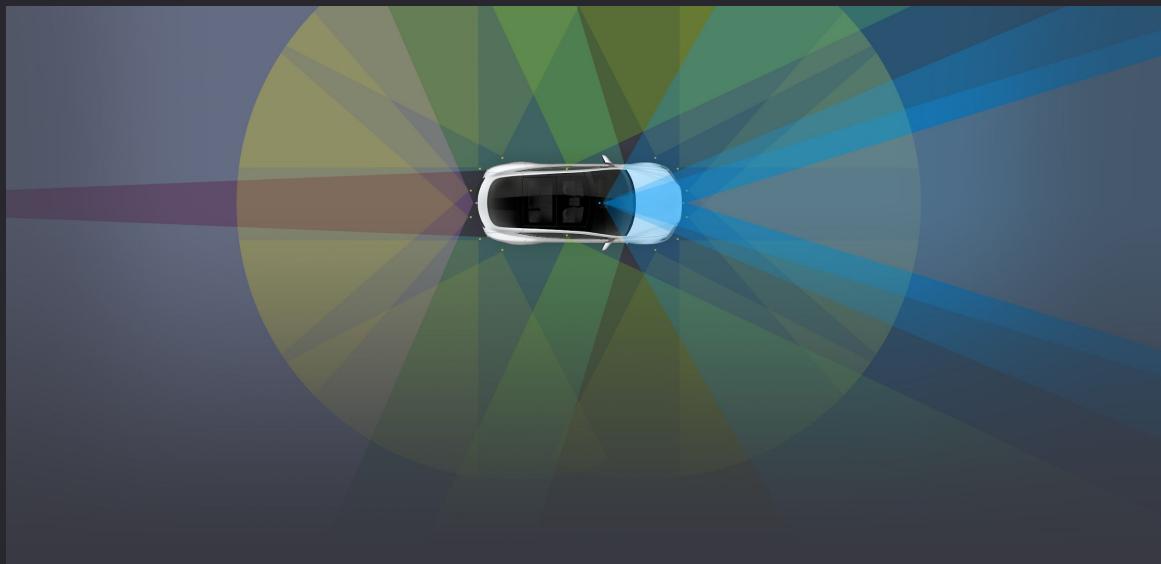
Computer Vision Application:

Amazon
GO



Computer Vision Application:

Tesla AutoPilot



Resources & References |

1. https://aws.amazon.com/computer-vision/?nc1=h_ls
2. <https://www.amazon.com/b?node=16008589011>
3. <https://www.tesla.com/autopilot>

Thank you for your time & attention!