SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Computer Vision

CS 136

Spring 2026 Section 02 In Person 3 Unit(s) 01/22/2026 to 05/11/2026 Modified 01/22/2026

Contact Information

Instructor: Dr Nada Attar

- **Email:** nada.attar@sjsu.edu
- **Website:** https://www.sjsu.edu/people/nada.attar/ (https://www.sjsu.edu/people/nada.attar/)

Office Hours

- *Monday 12:30 PM - 1:30 PM in person*
- *Wednesday 1:00 PM - 2:00 PM via Zoom (link)*

Course Information

Course Description and Requisites

Fundamental and advanced Computer Vision algorithms. Basic image processing techniques (image convolution, and region and edge detection). Complex vision algorithms for contour detection, depth perception, dynamic vision, and object recognition. Core topics (color processing, texture analysis, and visual geometry).

Prerequisite(s): CS 146, MATH 39, and CS 49C or equivalent (with a grade of "C-" or better in each). Computer Science and Software Engineering majors only.

Letter Graded

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

1. Explain the human visual system and how to use its techniques in computer vision
2. Use various algorithms to build computer vision applications
3. Apply advanced concepts leading to object and scene categorization from images
4. Analyze major technical approaches involved in computer vision
5. Be able to program various methods used for processing images, detecting edges, recognizing objects, and segmenting images
6. Embrace ethical adoption of computer vision technology

Course Materials

- Required: "Image Processing, Analysis, and Machine Vision" by Sonka, Hlavac, and Boyle (4th Edition, 2014). Thomson Learning. ISBN 10: 1133593607, ISBN 13: 9781133593607
- Recommended: "Hands-On Computer Vision", by Marc Pomplun (1st Edition, June 2020)
- Notes and research papers given by the instructor

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Canvas Learning Management System and Messaging

Course materials such as syllabus, handouts, notes, hands-on exercises, project instructions, etc. can be found

on the Canvas Leaning Management System course login website at http://sjsu.instructure.com. You responsible for regularly checking with the Canvas messaging system to learn of any updates.

Classroom Protocol

Please avoid disturbing the class: turn off cell phones (or put them on vibrate mode), no text messaging in the class or the exams, no taking pictures and video, avoid coming late. You may not publicly share or upload material for this course such as exam questions, lecture notes, or solutions without the instructor's consent.

Late homework/projects

All assignments and projects will be due at 6:00pm for the certain due date. The assignment will be posted at least a week before the due date to give enough time to work and ask for help during my virtual office hours. Please do not email me few hours before the deadline asking me to help you understand concepts. If I feel that you just start working on your assignment at the due date, I will ignore your emails because I know you won't be able to finish understanding the problem, coding, testing, compiling, and debugging in a few hours. So, please start early and manage your time wisely.

Late Submission:

- 0-6hr -> no penalty
- +6hr -> 50% penalty
- +12hr -> 100% penalty

If you believe an error was made in the grading of your assignments, quizzes, or exams, you can request a re-grade from the instructor. A request must be sent to the instructor no more than one week after the grades are posted.

Term Project

Students will do a term project as individual or team work. For this course, students must complete a project that utilizes programming or development software, algorithm programming or prototyping tools. The Term Project includes a written report and an in-class presentation, as well as a reflection paper.

Academic Integrity

Students are expected to be familiar with the University's Student Conduct Code (https://www.sjsu.edu/studentconduct/docs/SJSU-Student-Conduct-Code-2016.pdf). Cheating, plagiarism, and other forms of misconduct will not be tolerated and will have severe consequences. All prose submitted must be in the student's own words. Text not composed by the student will not be accepted.

The penalty for the first incident of cheating or plagiarizing is zero points on the assignment or exam, and a reduction of a full grade point from the final letter grade (e.g. B minus becomes C minus). The penalty for the second incident is an F in the course. Every cheating incident will be reported.

✔ Grading Information

Breakdown

- Mid Term Exam - 15 %
- Final Exam - 15 %

- Programming Assignments - 40 %
- Term Project - 15 %
- Quizzes/Homework - 15

Breakdown

Grade	Range	Notes
A+	100-96	
A	95-93	
A-	92-90	
B+	89-86	
B	85-83	
B-	82-80	
C+	79-76	
C	75-73	
C-	72-70	
D+	69-66	
D	65-63	
D-	62-60	
F	59 or below	

Resulting grade and related performance levels

Criteria

Final exam and quizzes are closed book; final exam is comprehensive. No extra point options in the final. No make-ups exams except in case of verifiable emergency circumstances. Any additional rules and regulations can be applied when taking exams to prevent dishonesty and cheating.

Type	Weight	Topic	Notes
Term Project			Students will do a term project. For this course, students must complete a project that utilizes programming or development software, algorithm programming or prototyping tools. The Term Project includes a written report and an in-class presentation, as well as a reflection paper.

Types of evaluations and related weights

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

When	Topic	Notes
Lecture 1/26	Course Mechanic & Introduction	
Lecture 1/28	The Human Visual System, Eye Movements and Visual Attention (handout)	
Lecture 2/2	Vision in Technical Systems (Ch.1)	
Lecture 2/4	Digital Images (Ch.2)	
Lecture 2/9	Representation of Color (Ch.2)	
Lecture 2/11	Basic Image Transformations (Ch.3)	
Lecture 2/16	Data structures for image (Ch.4)	
Lecture 2/18	Image Processing (Ch.5)	
Lecture 2/23	Image Processing (Ch.5)	
Lecture 2/25	Image Segmentation I (Ch.6)	
Lecture 3/2	Image Segmentation II (Ch.6)	

When	Topic	Notes
Lecture 3/4	Image Segmentation II (Ch.7)	
Exam 3/9	Midterm Exam	
Lecture 3/11	Image Segmentation II (Ch.7)	
Lecture 3/16	Shape representation and description (Ch.8)	
Lecture 3/18	Texture (Ch.15)	
Lecture 3/23	Stereo Vision and Depth (Ch.10)	
Lecture 3/25	3D Vision II (Ch.12)	
Lecture 4/6	Motion Analysis: differential motion analysis method (Ch.16)	
Lecture 4/8	Motion Analysis: optical flow (Ch.16)	
Lecture 4/13	Image Understanding and Scene Classifications (Ch.10)	
Lecture 4/15	Faces Classification Techniques, Emotion Detection from Facial Expressions (Ch.10), Data imbalance; Reduce Human Errors	
Lecture 4/20	Correcting the datasets; Biases in image representations; Image Data Compression (Ch.14)	
Lecture 4/22	Object Recognition (Ch.9)	
Lecture 4/27	Object Recognition (Ch.9)	
Lecture 4/29	Deep Learning: Convolutional Neural Networks (Notes); bias in classification	
Lecture 5/4	Term Project Presentation	
Lecture 5/6	Term Project Presentation	
Lecture 5/11	Term Project Presentation	
Exam 5/13	Final Exam: May 13, 10:45 AM-12:45 PM	