



CSCI 576 - Computer Vision

COURSE SYLLABUS: Summer II 2025

Instructor: Dr. Mohammad Alsmirat

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Communication Response Time: 24 hours

Office Hours: Online through MS teams on Tuesday, 12:00 pm – 2:00 pm or by appointments.

Meeting Time and Place

Meets 7/7/2025 through 8/7/2025 All course related material and videos will be posted on D2L Course page.

Textbook: All required reading material will be posted on D2L.

References:

1. Computer Vision: Algorithms and Applications, 2nd ed. © 2022 [Richard Szeliski](https://szeliski.org/Book/) (<https://szeliski.org/Book/>)
2. Digital Image Processing 4th Edition, by Rafael Gonzalez, Richard Woods
3. Shanmugamani, R.2018.Deep Learning for Computer Vision: Expert techniques to train advanced neural networks using TensorFlow and Keras.1st Edition, Packt Publishing,.
4. Elgendy, M.2020.Deep Learning for Vision Systems.1st Edition, Manning Publications.

Prerequisite

- CSCI 515 or CSCI 513.

Course Description

This course will introduce Computer Vision. Topics include the fundamental theory and techniques of digital image representation, modelling and processing; edge and feature detection; segmentation and recognition;

motion estimation, etc. This course will also introduce state-of-art methods in Computer Science research and applications such as face detection, text recognition, and object classification. Prerequisites: CSCI 515 or CSCI 513.

Course Learning Outcomes:

By the end of successful completion of this Course, the student will be able to:

1. Understand image, video, and color representation
2. Identify various computer vision tasks
3. Develop a computer vision algorithm to solve a particular problem.
4. Utilize machine and deep learning for computer vision applications.
5. Discuss, document, and present research work in a sub-field of computer vision.

Distribution of Course Topics/Contents

Week	Topic
1	Overview to the course Introduction to computer vision Introduction to programming for computer vision and image processing
2	Image Processing as a pre-step for Computer vision
3	Convolutional neural network Design options in CNN
4	Segmentation Object Detection and Recognition
5	Emerging Applications of Computer vision

Students are assessed as follows:

Assessment Tool(s)**	Due Date	Weight (%)
Assignments	End of weeks 2, 3, and 4	18 (6 each)
Quizzes	Fridays of Weeks 1,2,3,4	24 (6 Each)
Final Exam (Comprehensive Exam)	Friday of Week 5	22
Paper Critique Report and Presentations	End of Weeks 3 and 4	16 (8 Each)
Project	End of Week 5	20
Total		100

Letter grades will be determined using a standard percentage of points scale:

Letter Grade	Cut-off Score
A	90%
B	80%
C	70%
D	60%
F	Below 60%

Scope and Nature of Assessment Tools:

Paper Critique

Students can work on this individually or in groups of up to 2 members. A list of papers will be uploaded on the D2L Course page. Each group should choose 2 papers with different topics and read them carefully. Each group should prepare a presentation about each of the chosen paper that covers the following:

- The problem definition that the paper discusses.
- Full background information
 - Any reading in the background of the paper topic the students needed to do to understand the paper should be included here.
- Discussion of the related work.
- Discussion of the solution(s) in the paper.
- Discussion of the evaluation methodology and the used data and performance metrics.
- Presentation of the paper results.
- What the paper misses or what can be done on top of the work done in the paper (very important).

The presentation slides for each paper should be presented in 20 minutes. The evaluation of the presentation will be based on:

- Your general understanding of the paper domain.
- Your understanding of the problem that the paper tries to solve.
- Your understanding of the solution(s) included in the paper.
- Your understanding of the evaluation methodology used in the paper.
 - If you can replicate this, a good bonus will be considered.
- Your vision of a future work that can be built over this paper.

Project Assignment

The aim of the project is to train you to conduct research professionally in one of the computer vision and image processing fields. Students can work on this individually or in groups of up to 2 members. You can choose any field of the following, find a problem in one of them, and try to find a way to solve it. The fields are:

- Computer vision for medical image processing
- Image generation (GANS)
- Image segmentation
- Image classification

- Object detection and recognition

You can also build on the papers that you choose for your presentation and reproduce the results that the authors have in the paper and compare the results with other recent works and propose how can you enhance the work already done.

Reports Requirements

- Follow IEEE transaction template (IEEE explore website). Overleaf shared project should be created. Will be explained later.
- Final report should contain title, background information, literature review, problem statement, solutions, experiment results, references.
- All codes should be submitted with the report.
- 10-20 pages
- An electronic submission is required.

Letter grades will be determined using a standard percentage of points scale:

Letter Grade	Cut-off Score
A	90%
B	80%
C	70%
D	60%
F	Below 60%

Doing all your assignments and project will help the borderline cases. Check your grades often. Any score may be disputed up to seven (7) days after the score is posted. After 7 days the score remains as-is.

Technology Requirements - LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

Access and Navigation

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a

computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

Communication and Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

Methods of Instruction

The course will consist mainly of recorded lectures and reading material. Important material from the text and outside sources will be covered during the lecture. Therefore, watching the lectures are essential for success. Students will benefit from attending one of the weekly office hours and asking questions if any of the material or assignment is not clear.

This syllabus contains an overview of what will be covered in class; for specific information, students are referred to the class web page maintained on D2L course management system. The course web page will contain lectures, assignments, project information and supporting material. Information on D2L will be updated frequently so it is a good idea to check it regularly. Assignments are posted on D2L and should be submitted through D2L.

Late Submissions Policy

All work submitted electronically must be submitted by midnight of the due date. Late work will be deducted by 10% for each day past the due date. The assignment will not be accepted after 2 days from the due date.

Tips for Success in the Course

- Watch the recorded lecture video, and make sure to ask questions if the material is not clear.
- Read all assigned reading and supplemental materials.
- Check D2L at least once a day.
- Practice the examples and practice exercise we go through during the lectures.
- Start your homework & project assignments early.
- Do your own work. Do not copy other's work.
- Contact the instructor if you have difficulties in lecture material and the assignments.

Make-up Policy

No individual make-up test will be permitted except in the case of a formal institutional excuse. There will be no makeup for assignment deliverables.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: <https://www.britannica.com/topic/netiquette>

Academic Honesty

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct). It is the policy of the University, that no form of plagiarism or cheating will be tolerated. Plagiarism is defined as the deliberate use of another's work and claiming it as one's own. This means ideas as well as text or code, whether paraphrased or presented verbatim (word-for-word). Cheating is defined as obtaining unauthorized assistance on any assignment. Proper citation of sources must always be utilized thoroughly and accurately. If you are caught sharing or using other people's work in this class, you will receive a 0 grade and a warning on the first instance. A subsequent instance will result in receiving an F grade for the course, and possible disciplinary proceedings. If you are unclear about what constitutes academic dishonesty, ask.

For more details and the definition of academic dishonesty see the following procedures:

[Graduate Academic Dishonesty 13.99.99.R0.10](#)

Special Needs

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

East Texas A&M University

Gee Library- Room 132

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

East Texas A&M University Supports Students' Mental Health

The Counseling Center at East Texas A&M University, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and East Texas A&M University Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M University campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.