

INSS 5312 (35206)
Summer 6/7 to 7/30, 2021
Tues 6 – 8:50pm

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COMMERCIAL IMAGERY

Texts:

All assigned readings (see Schedule below) will be posted on Blackboard, accessed from the <http://my.utep.edu> homepage, or accessed via the website listed on the syllabus.

Course Description: This course explores the domains of open source commercial imagery and remote sensing. These increasingly sophisticated images have numerous applications across a diverse variety of fields such as defense, conservation, emergency response, agriculture, engineering and planning, mapping, and energy. This course is designed to explore the ways in which imagery is obtained and employed, as well as the capabilities of the various sensors utilized on commercial satellite and aerial platforms. This includes optical imaging, multispectral, hyperspectral, thermal, radar and LIDAR. There will be a particular emphasis on defense and intelligence applications.

Note: It is essential that students come to class having read the assigned material. Students are expected to actively participate in class discussions.

Course Goals and Objectives- at the end of this course you will be able to:

EXPLAIN how the employment of commercial imagery systems supports specific national security objectives

EXTRACT INFORMATION from remotely sensed data

IDENTIFY the fusion potential of different intelligence products and remote sensing data

FUNDAMENTALLY ANALYZE the relevance and application of various imagery products to given security operations, both domestically and internationally

ENGAGE in effective decision-making utilizing commercial imagery, employing such tools in areas such as non-proliferation and military planning

PRESENT a detailed brief utilizing commercial imagery applied to a fundamental national security concern

Grading / Course Requirements:

Grades will be based on a point system. The total points for the semester are 1000. These points are earned by completing homework exercises, two exams, and a final project/presentation. Homework exercises will be handed out in class and posted on Blackboard. Each Homework assignment is worth 75 points (300 possible points). The two exams are worth 150 points each and the final project/presentation is worth 400 points. Late assignments will be graded solely at the discretion of the instructor.

Homework Assignments (noted as “HW” on syllabus):

All homework questions must be submitted in Microsoft Word format (.doc, .docx) with images in an easily readable format (preferably JPEG, TIFF or GIF). Map elements should be placed on the map, these must include: title, body, scale, legend, north arrow and grid as needed to adequately describe the data. The homework is due on the assignment date noted on the syllabus.

Exams:

The exams will focus on your comprehension of the material in both the assigned readings and lectures. It will assess your understanding of how commercial imagery is derived as well as how it may be applied.

Specific project/presentation requirements:

The research project will center on the application of commercial imagery systems to a fundamental national security concern as approved by the instructor. It must be of appropriate length (roughly 15 pages), employ the various concepts covered in class, and demonstrate realistic, quality analysis. It should be written in a professional style, as if you were already working for an IC agency, without slang, cynicism, or opinions and express ideas with proper grammar and spelling. All papers should be in 12 point font (Times New Roman or Courier) with 1 inch margins, double spaced. They should be written in the APA documentation style (you may begin learning about this style by going to <http://writing.wisc.edu/Handbook/DocAPA.html>). The last week of class will be devoted to student presentations of your projects. You may choose the delivery mode of the presentation, i.e. slides, video, etc. However, the presentation should be 8-12 minutes (10 min preferred) in duration.

Miscellaneous Items:

- a) WITHDRAWAL – you may drop the course before **July 9th** with a grade of “W” by completing the form at the Registrar’s Office. This is *your* responsibility – you will receive a failing grade if you just cease coming to class.
 - b) Please be ON TIME and turn off all cellular phones, pagers, etc. and respect the rights of those around you by not creating disturbances.
 - c) CHEATING – this will not be tolerated. You will visit the Dean of Students.
 - d) EMERGENCIES– contact and provide documentation to me as soon as possible, and I will work with you to help as much as I reasonably can.
 - e) Please let me know as soon as possible if coordination is required with the Center for Accommodation and Support Services (CASS) for testing, note taking, or any other requested accommodation. You may contact the CASS at 747-5148.
 - f) I AM HERE TO ASSIST YOU – if you wish to see me, please feel free to drop by my office or make an appointment.
 - g) Late assignments will lose points at the discretion of the instructor.
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Plagiarism and Academic Dishonesty Statement:

Academic dishonesty or cheating is simply unethical and not acceptable under any circumstances. Plagiarism is a form of cheating that involves “stealing” the words and thoughts of others. It is a very serious academic violation and cannot be tolerated. The most common form of plagiarism is using information or original wording in a paper or other assignment without giving credit to the source of that information or wording. Plagiarism also includes the direct copying of a source verbatim (word for word) and incorporating that copied material into the student’s paper or assignment without first paraphrasing with proper referencing or placing the copied text into a direct quotation, again with appropriate footnotes or citations. Students must use their own words when not using direct quotes sparingly and appropriately to provide examples, evidence, or illustrate specific points. Students cannot simply “cut and paste” wording or text from source material to artificially “construct” their papers, essays, and other assignments. This is also considered plagiarism, even if references are done properly. Likewise, students must not submit work under their name that they did not do themselves. Students also may not submit work for this course that they produced for another course. If students are found to be cheating in any capacity including plagiarism and collusion, they will be subject to disciplinary action, per UTEP catalog policy. Cases of academic dishonesty will be sent to the Office of Student Conduct and Conflict Resolution for adjudication and possible sanctions. Possible penalties for academic dishonesty include a zero for the assignment, a failing grade for the course, suspension, and even expulsion from the university. Students are responsible for understanding their specific obligations to maintain academic integrity at all times. Please refer to the following link for further information on UTEP’s policies: <https://www.utep.edu/student-affairs/osccr/> .

SCHEDULE

	TOPIC	READING ASSIGNMENTS / NOTES	DATE (due)
A	COMMERCIAL IMAGERY / REMOTE SENSING BACKGROUND	<p><i>Scan</i> NSA (COMM IMAGERY FROM 1970’s TO TODAY)- http://nsarchive.gwu.edu/NSAEBB/NSAEBB404/ COMMERCIAL IMAGERY OVERVIEW BRIEF</p> <p>RISE OF COMMERCIAL SATELLITE IMAGING SHUTTER CONTROL COMMERCE DEPT REMOTE SENSING REGS <i>Scan</i> 2020 STATE AND FUTURE OF GEOINT and https://www.nesdis.noaa.gov/CRSRA/licenseHome.html JANE’S IHS IMAGERY ANALYSIS NATANZ</p> <p>https://www.nextbigfuture.com/2019/09/us-spy-satellites-at-diffraction-limit-for-resolution-since-1971.html ?</p> <p>https://eos.com/blog/satellite-data-what-spatial-resolution-is-enough-for-you/</p>	<p>JUN 8</p> <p>JUN 8/10</p>
B	ELECTROMAGNETIC RADIATION BASICS	<p>FUNDAMENTALS OF REMOTE SENSING, CH. 1 <i>Scan</i> CAMPBELL, CH. 2 (skip over math as desired)</p>	<p>JUN 15</p> <p>JUN 17 (HW 1)</p>

C	SENSORS / IMAGERY	<p>CLARK, CH. 7 FUNDAMENTALS OF REMOTE SENSING, CH. 2 FUNDAMENTALS OF REMOTE SENSING, CH. 3.1 – 3.8</p> <p>SPATIAL RESOLUTION – DIGITAL GLOBE CAMPBELL, CH. 8 INTRODUCTION TO HYPERSPECTRAL SENSING MULTISPECTRAL VS. HYPERSPECTRAL IMAGERY EXPLAINED WHAT IS HYPERSPECTRAL IMAGING HOW TO INTERPRET FALSE COLOR IMAGES</p> <p><i>Scan</i> SPECTRAL IMAGING FOR RS</p>	<p>JUN 22</p> <p>JUN 24 (HW 2)</p>
D	SATELLITES / AERIAL PLATFORMS	<p>FUNDAMENTALS OF REMOTE SENSING, CH. 3.9 – 3.10 REMOTE SENSING PLATFORMS AND SENSORS</p> <p>LANDSAT https://landlook.usgs.gov/</p> <p>EOS LAND VIEWER https://eos.com/products/landviewer/</p> <p>SATELLITE SENSORS/CONSTELLATIONS https://www.satimagingcorp.com/satellite-sensors/ https://www.maxar.com/constellation</p> <p>WV-2 EIGHT SPECTRAL BANDS WV-3 SENSOR</p> <p>UAV’S IN REMOTE SENSING AND SCIENTIFIC RESEARCH</p> <p>VIDEO IMAGERY https://earth.space/vivid-i/</p>	<p>JUN 29 (TEST 1)</p> <p>JUL 1 Paper proposal</p>
E	APPLICATIONS – DEFENSE AND INTELLIGENCE	<p>GLOBAL ENHANCED GEOINT NGA NEWS RELEASE</p> <p><i>Scan</i> GEOINT BASIC DOCTRINE GIS WEBSITES / VIDEO (TBA in class)</p> <p>JANE’S IMAGERY ANALYSIS WITHIN OSINT JANE’S IMAGERY ANALYSIS BROCHURE JANE’S S. CHINA SEA CASE STUDY - https://www.janes.com/military-threat-intelligence/military-capabilities/south-china-sea-threat-analysis-case-study ARM CONTROL WONK PODCASTS - https://www.armscontrolwonk.com/ FUNDAMENTALS OF REMOTE SENSING, CH. 4</p> <p>SATELLITE IMAGERY OFFERS TOOLS TO MILITANTS RADAR IMAGERY ANALYSIS ... EXAMPLES: https://www.isis-online.org/ https://amti.csis.org/island-tracker/ https://www.38north.org/ https://beyondparallel.csis.org/sil-li-ballistic-missile-support-facility/</p>	<p>JUL 6/ 8</p> <p>JUL 13</p>

F	APPLICATIONS – OTHER	<p>FUNDAMENTALS OF REMOTE SENSING, CH. 5 COPERNICUS SATELLITES - http://www.copernicus.eu/ SATELLITE IMAGING CORP (APPLICATIONS) - https://www.satimagingcorp.com/applications/</p> <p>GIS Geography – 100 RS APPS and USES https://gisgeography.com/remote-sensing-applications/ MAPPING MINERALS WITH LIGHT SAT IMAGES IN SUPPORT OF EMERGENCY ENVIRONMENTAL RESPONSE SATELLITE IMAGERY FOR ASSESSING RANGELAND RESOURCES EMERGENCY RESPONSE IN THE ARCTIC - http://eijournal.com/print/articles/technology-advances-support-emergency-responses-in-extreme-environments</p> <p><i>OPTIONAL REFERENCE READINGS (as desired):</i> REMOTE SENSING OF THE ENVIRONMENT JOURNAL - https://www.journals.elsevier.com/remote-sensing-of-environment EARTH IMAGING JOURNAL https://eijournal.com/</p>	<p>JUL 15 (HW 3)</p> <p>JUL 20 (TEST 2)</p>
G	ETHICS AND HUMAN RIGHTS	<p>SATELLITE IMAGERY AND HUMAN RIGHTS https://library.theengineroom.org/satellite-imagery-human-rights/</p> <p>OPINION: THE PRIVACY PROJECT</p> <p><i>Scan RS OF CROSS BORDER CONFLICTS</i></p> <p>GEOINT LAW AND POLICY</p> <p>AMNESTY INTERNATIONAL https://www.amnesty.org/en/latest/news/2019/12/amnesty-international-updates-citizen-evidence-lab-for-cutting-edge-open-source-human-rights-investigations/</p>	<p>JUL 22 (HW 4)</p>
H	FUTURE DEVELOPMENTS / CURRENT NEWS	<p>SATELLITE IMAGERY IN YOUR NEXT INVESTIGATION DEEP LEARNING MEETS GIS https://www.esri.com/about/newsroom/arcwatch/where-deep-learning-meets-gis/ TRAJECTORY MAGAZINE https://trajectorymagazine.com/ OFFICE OF SPACE COMMERCE http://www.space.commerce.gov/category/remote-sensing/ BREAKING DEFENSE COMMERCIAL REMOTE SENSING https://breakingdefense.com/tag/commercial-remote-sensing/</p>	<p>JUL 22</p>
I	FINAL PROJECT	<p>PROJECT DUE / CLASS PRESENTATIONS</p>	<p>JUL 27</p>

There will be an extra credit (optional) final as directed by the instructor.