Department of Geography and Geoinformation Science

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GGS 590
Geosocial Analysis
Spring 2015

1. **General Information**

   Instructor: Dr. Arie Croitoru
                                      (Supplemented with Dr. Tony Stefanidis (GGS) and Dr. Andrew Crooks (CSS))
   Where: Exploratory Hall 2103
   When: Tuesdays 4:30pm to 7:10pm.
   Course website: Blackboard/PBworks
   Credits: 3.0
   Instructor's Office Hours: Exploratory Hall 2205, Mon 10:00am - 11:00am or by appointment.
   Preferred contact method: email to acroitor@gmu.edu. I will respond Monday to Friday during regular
   office hours.

2. **Course Objectives**

   Over the last few years, social media (e.g. Twitter, Flickr, YouTube, etc.) have become an integral part of the modern information and communication landscape. Through social media, individuals, groups, organizations, and even states can now acquire, probe, and deliver information, as well as shape and reshape public opinion. At the same time, social media content if increasingly to physical geographical locations. Fueled by advances in of Web 2.0, mobile computing, and spatially-aware technologies (i.e. GPS enabled smartphones), social media can also provide a unique opportunity to observe and study the flow of information in both cyber and physical spaces. Employing a geographically driven analysis approach allows us not only to track how information flows, but also to derive information about real-world events and happenings. We call this geospatially-driven approach **GeoSocial Analysis** - a new interdisciplinary frontier in the geographical and computational social sciences. As an introduction to GeoSocial Analysis, this course has the following objectives:

   A. Provide an understanding of the <u>fundamentals</u> and <u>theory</u> upon which GeoSocial Analysis builds.
   B. Introduce key <u>analytical techniques</u> and <u>tools</u> that are used in GeoSocial Analysis.
   C. Develop the ability to <u>apply</u> these capabilities for various tasks.
   D. Identify and gain insight into some of the <u>emerging trends</u> in GeoSocial Analysis as applied to various application areas (e.g., emergency response, political movements, etc.).

3. **Learning Outcomes**

   By the end of the course each student will be able to:
   A. Have an understanding of the fundamentals, theory and techniques of GeoSocial Analysis.
   B. Have the ability to appropriately apply the tools, algorithms and concepts covered in the course for various hypothetical and real-world data processing tasks.
   C. Given a problem or task, be able to effectively analyze it, identify key elements and potential difficulties, and define a strategy for successfully addressing it.
   D. Articulate and effectively communicate concepts and ideas related to GeoSocial Analysis through written reports and visualization products, and oral presentations.

4. **Delivery Method**

The course will be taught as a combination of lectures, topic/problem oriented discussion, and tutorials based on assigned reading and class discussion.

5. **Textbook**

As this is a new emerging topic, there is no single textbook or resource that will cover all the course materials (or even a substantial part of it). Accordingly, the course reading materials will include a curated collection of academic papers, reports and white papers, book chapters, and other online resources.

6. **Course outline (tentative)**

In this course we will cover the following topics (please note that the topics and their order are subjected to change at the discretion of the instructor, any changes will be announced in class):

Date	Topic	Exam	Assignment	
			Release	Due
1/20	Introduction and overview			
1/27	Traditional Sensing methods			
2/3	The evolution of the GeoWeb and Social Media			
2/10	Harvesting social media		Lab 1	
2/17	Analyzing geo-social networks (1)			
2/24	Analyzing geo-social networks (2)		Lab 2	Lab 1
3/3	Analyzing geo-social networks (3)			
3/10	*** Spring Break ***			
3/17	Community detection		Lab 3	Lab 2
3/24	Spatial and spatiotemporal clustering			
3/31	Visualizing networks		Lab 4	Lab 3
4/7	Social media content analysis			
4/14	Biases and Data quality			Lab 4
4/21	Project presentations (1)			
4/28	Project presentations (2)			

Please note that the dates of the topics are tentative. Any schedule changes will be announced in class.

7. **Course Expectations**
   - This is a graduate course that involves some use of mathematical and statistical concepts.
   - The course involves the use of computer algorithms. During the course, you will be required to develop and demonstrate your understanding of these concepts, and implement algorithms in a computer environment (e.g. writing computer scripts and programs).
   - Your work should show attention to detail, with the expectation that the experience provide the basis for potential employers to consider your skills.
   - I expect preparation and participation at every class. Attendance is critical (attendance may be verified during class) - you are expected to be at all classes and to make productive use of class time. Your active participation in the class is essential to the success of this course.

8. **Grades**

At the end of the term all the marks will be totaled as a weighted average according to the following weights:

Lab assignments	30%
Paper reviews (2)	20%
Course Project	45%
Course Participation	5%
Total:	**100%**

Please note that, in general, assignments and exams will not have the same weight. The weight of each individual assignment or exam will be indicated on the assignment form. Final grades at the end of the course will be assigned using **a combination of absolute achievements and relative standing in the class**.

Incomplete grades policy: following the university policies, an "Incomplete" grade (IN) <u>may</u> be assigned to a student who is passing a course but who may be unable to complete scheduled course work due to a cause <u>beyond</u> reasonable control. Any requests for an incomplete grade must be submitted **in writing** during the last week of classes, and should indicate the reason for the request. If an IN grade is granted, it is <u>your responsibility</u> to contact the instructor at the end of the semester to make proper arrangements for completing any missing work. For further details on the IN grade please visit: http://registrar.gmu.edu/records/ incomplete.html

9. **Exams**
   There are no written exams in the course.

10. **Assignments and presentations:**
    The course will include several mandatory lab assignments on selected topics from the material covered in class and in the assigned reading. Assignments may include tasks such as algorithm development and implementation, analysis of data processing results, and discussion/analysis of theoretical concepts and test cases. All assignments are mandatory. Typically, two weeks will be allocated for every assignment (please see Section 11 for details on late submission policies). Submission of assignments should be done only **through the Blackboard course website**.

    In addition to lab assignments, each student will be required to prepare an in-depth review of two peer-reviewed article will be given. The review will consist of two elements – a written summery and a class presentation.

    Please note: Unless noted otherwise, we will grade only Assignments that are submitted through the "Assignments" section of the Blackboard system. Please DO NOT email assignments directly to the instructor's Mason email (@gmu.edu) or through their Blackboard email.

11. **Late lab submission:**
    Labs submitted between 1 to 3 calendar days past the due date would result in a late penalty of **5 points per day**. As a general rule, labs submitted after **more than 3 days will not be accepted** and incomplete lab work may not be completed after the due date. Rare exceptions to this policy may be made on a case-by-case basis at the discretion of the Instructor.

    Please note: Deferral of course work is a privilege and not a right; there is no guarantee that a deferral will be granted. Please make sure you notify the instructor or the teaching assistant in writing as soon as you know a deferral is required.

12. **Research project**
    The research project is a major component in the course. Students are expected to work on the project in groups of two, and a single grade will be given per group. Generally, the project is expected to focus on either the use of geosocial analysis for deriving knowledge from social media, or on the development of an analysis method/algorithm to address a specific challenge in geosocial analysis. The project includes the following components:
    a) Project proposal to be approved by the instructor (to be delivered by **February 10, 2015**)
    b) Final project presentation (to be delivered during the last two weeks of the semester, as assigned by the instructor).
    c) Project paper (to be delivered no later than **May 8, 2015**). Late submission of the final project paper will **not be accepted**.

    Detailed instructions and grading rubrics regarding each step will be provided during the course.

13. **Academic integrity:**
    George Mason University is committed to the **highest standards** of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the

policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the GMU honor code (online at academicintegrity.gmu.edu).

14. **Course website:**
   The course has a Blackboard website. This website will provide you a single portal through which you may obtain lecture notes, retrieve assignment data and, review links to additional materials, and receive special announcements. You are required to visit the course website **regularly**. Please contact ITU to resolve any issues accessing this website.

15. **Electronic Communication:**
   - All course related email correspondence, including submission of assignments, should be made through the course Blackboard website. Please DO NOT email the instructor or the TA through their @gmu.edu address.
   - **Use of MasonLive/Email (GMU Email):** Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. [See https://thanatos.gmu.edu/masonlive/login].

16. **Responsible Use of Computing:** Students must follow the university policy for Responsible Use of Computing. [See http://universitypolicy.gmu.edu/1301gen.html].

17. **Other Student Resources:**
   - **University Libraries:** University Libraries provides resources for distance students. [See http://library.gmu.edu/distance].
   - **Writing Center:** The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. [See http://writingcenter.gmu.edu]. You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the Online Writing Lab (OWL) (found under Online Tutoring).
   - **Students with special needs:** If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS - http://ods.gmu. Please do not hesitate to contact the course team regarding your special needs if you encounter any issues or have any concerns.
   - **Counseling and Psychological Services:** The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See http://caps.gmu.edu].
   - **Family Educational Rights and Privacy Act (FERPA):** The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. [See http://registrar.gmu.edu/privacy].

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported by the instructor.

Note: Recording of any kind (audio, video), reuse of course materials, and further dissemination of the course content is not permitted unless prior written consent of the professor and George Mason University has been given or if recording is part of an approved accommodation plan.

General guidelines for assignment preparation and submission
(For detailed instructions please refer to the course website)

Grades of assignments will be based on:

a) **Academic merit** of your answers.

b) **Conciseness** and **completeness** of your answers. Please write to the point and explicitly address the question or task. Avoid using unnecessary graphics (figures, tables, graphs etc.) unless they serve a specific purpose. Make sure to use captions and to refer to the graphics you include in your written answer. Graphics without any reference or accompanying explanation will be disregarded.

c) **Presentation**. Remember that your assignment report is a reflection of your thinking and learning process. Please organize your report in a logical fashion so that your answers could be easily identified. A general format for your presentation should, as a minimum, include the following components: (1) a cover page clearly indicating your name, the course number (416 or 680) the lab number, and the submission date (2) Question number, (3) Your written answer and/or description and discussion of your results, and (4) Visualization of your results, e.g. images, graphs, tables, as necessary.

d) **Organization**. your lab should be submitted as a single PDF file containing your lab report. If you are required to submit multiple files (e.g. matlab code files) all files (including the report) should be submitted in a single ZIP file.

Additional hints:

1. Please remember that your assignment is a **professional document**, and should therefore be formatted and constructed accordingly. All assignments are to be typed. Hand-written assignments will not be accepted.

2. Submission of a softcopy of your lab will be made through Blackboard. It is not required to submit a hardcopy of your lab

3. The electronic submission of your assignment report should be made in a PDF format. Please do not submit MS-Word files!

4. Avoid using screenshots whenever possible. Instead use the print option in the software you are using to produce a PDF document.

5. If more than one file is submitted, you may submit a single **ZIP** file containing all the assignment files. Please note that other compression formats (e.g. rar files) will not be accepted.

6. Please make sure you have a backup of all the materials you submit.