

GREGORY J. BRUNNER

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PROFILE

Mr. Brunner is an experienced Scientist, Programmer, and Professor with a demonstrated history of solving problems involving big data, geographic data, and imagery. He is an expert in the fields of Geographic Information Systems, Geospatial Application Development, Remote Sensing, Big Data Analytics, Python, and ArcGIS. He is an excellent teacher who has taught undergraduate and graduate level geospatial programming courses at Saint Louis University. He is an intelligent and passionate research professional with a Master of Science (MS) in Physics from Rice University. He has given presentations across the world on topics ranging from Green Infrastructure to Augmented Reality.

EXPERIENCE

Senior Scientist	Esri	April 2016 – Present
	St. Charles, MO	

Currently serves as the lead on multiple projects within Esri (<http://www.esri.com>). Lead developer on an effort to develop data quality and data comparison algorithms. Lead scientist on an effort to implement large scale raster processing and machine learning algorithms using Amazon Web Services and ArcGIS Image Server. Lead developer for the Esri Python raster function development effort (<https://github.com/Esri/raster-functions/>). Presented at numerous conferences, including but not limited to Esri's Federal GIS Conference, Esri's Developer Summit, and Domino Data Lab's Data Science Pop-up.

Imagery Scientist	Esri	July 2011 – Apr 2016
	St. Charles, MO	

Led effort to develop a framework to evaluate large amounts of geographic content. Developed Python tools to automate content assessment. Developed imagery processing pipeline that extracted 3D point clouds from oblique aerial photos. Presented at numerous conferences on topics including but not limited to 3D augmented reality, imagery analysis, and geographic data quality.

Adjunct Professor	Saint Louis University	Jan 2017 – Present
	St. Louis, MO	

Teaches GIS 4090/5090 - *Introduction to Programming for GIS and Remote Sensing* and GIS 4091/5091 - *Advanced Programming for GIS*. GIS 4090/5090 introduces students to Python programming and its applications to remote sensing and GIS. Through completing this course, students are able to use Python to perform common GIS and remote sensing analysis tasks, automate workflows, and develop custom Python tools. In GIS 4091/5091, students learn how to publish, consume, and analyze web services using Python, Javascript, and HTML. They are introduced to powerful, advanced Python libraries such as Pandas, Numpy, ArcGIS, and Folium in addition to learning advanced geographic data visualization techniques that leverage Python, Javascript, and web APIs. They also learn how to use Javascript to create their first stand-alone web applications.

GeoSLU Advisory Board	Saint Louis University	Aug 2018 – Present
	St. Louis, MO	

Currently serving on the advisory board for the GeoSLU Big Idea, an initiative to enhance geospatial research, training, and innovation at Saint Louis University.

Geospatial Advisory Board Kaskaskia College Aug 2015 – May 2018
Centralia, IL

Served on the Advisory Board for the Kaskaskia College (KC) GIS Program which was awarded a National Science Foundation Advanced Technology Education grant linking a new geospatial technology program at KC to local/regional industry in South-Central Illinois.

Associate Scientist Sensing Strategies, Inc. Mar 2008 – July 2011
Pennington, NJ

Developed algorithms for the analysis of space-based and ground-based sensor data in MATLAB. Implemented algorithms in data analysis software written in C++. Designed user interface for viewing sensor data. Implemented geographic information system software TatukGIS and Google Maps in graphical user interface for analyzing sensor data. Performed analysis on LiDAR sensor data. Constructed images from sensor data. Calibrated sensors in laboratory. Participated in field tests of remote sensing equipment.

Graduate Student Researcher Rice University June 2005 – Mar 2008
Houston, TX

Completed multiple astronomy research projects in collaboration with scientists across the world that contributed to publications and conference presentations. Developed computational algorithms to analyze large volumes of spectral data. Composed a research grant and received approval from Spitzer Science Center and the NASA Jet Propulsion Lab.

Visiting Research Fellow Spitzer Science Center, Caltech Aug 2006 – Feb 2007
Pasadena, CA

Worked with *Spitzer Space Telescope* Infrared Spectrograph instrument team to develop data reduction pipeline that decomposes spectroscopic data cubes into maps. Wrote paper summarizing analysis of spectra from nearby galaxies.

EDUCATION

Rice University, Houston, TX
M.S., Physics, 2008

Johns Hopkins University, Baltimore, MD
B.S., Physics, 2005
Minor in Earth and Planetary Science

HONORS AND AWARDS

Certificate of Appreciation from the National Geospatial-Intelligence Agency's Geospatial Analyst Hub (GA Hub) for *Capturing and Sharing Technical How – To*, June 2018

Certificate of Appreciation from the National Geospatial-Intelligence Agency's Geospatial Analyst Hub (GA Hub) for *Excellence in Using Statistics in Python*, July 2017

Certificate of Appreciation from the National Geospatial-Intelligence Agency's Geospatial Analyst Hub (GA Hub) for *Python Party Presenting – Sharing Scripting Expertise with Others in an Engaging Manner*, June 2016

Spitzer Visiting Graduate Student Fellow, Spitzer Science Center, 2006–2007

NASA Undergraduate Student Research Program Fellow, NASA Jet Propulsion Lab, Summer 2004

Caltech Summer Undergraduate Research Fellow, California Institute of Technology, Summer 2004

PROFESSIONAL AFFILIATIONS

The American Society for Photogrammetry and Remote Sensing, ASPRS (2011 - 2018)

Association for Unmanned Vehicle Systems International, AUUVSI (2014 - 2016)

ASPRS National Board of Directors (2015 - 2016)

ASPRS Heartland Region Director (2015 - 2016)

ASPRS Heartland Region President (2013 - 2014)

The American Astronomical Society (2006 - 2011)

STATEMENT OF TEACHING PHILOSOPHY

My goal is to position my students to get their dream job. In order to attain and succeed in their dream job, they need to be able to identify a problem, design a solution, and implement the solution using geographic information systems (GIS) technology. Students who take my classes are there to develop these skills and augment them by learning new programming, analytical, and mapping techniques. They have identified that learning how to program is a skill that will help them achieve their career goals and they have an interest in diving deeper into creating maps and using GIS to solve problems of local, regional, and global importance.

The past two years as an Adjunct Instructor in the Department of Earth and Atmospheric Sciences, I have taught both *Introduction to Programming for GIS and Remote Sensing* (GIS 4090/5090) and *Advanced Programming for GIS* (GIS 4091/5091). These courses are cross listed for both undergraduate and graduate students to take. Of the graduate students who take my class, some are full-time graduate students pursuing a master's degree or a PhD and some are part-time students who also work full-time jobs. The students who enroll in these classes come from diverse fields of study, such as meteorology, biology, geology, public health, and social science. I strive to prepare each of my students for a career in their chosen discipline. It can be challenging to reach each student in a class with such diverse interests. My classes can be challenging for students who want to learn how to program but are intimidated by the topic. It is my job to overcome these challenges and I do this in several ways:

1. I mentor. I put tremendous effort into creating the materials I use to teach, but I am also eager to talk to students about applications of what they are learning and potential career paths that are open to them.
2. I make myself very available. During class periods, I spend about half the time lecturing, discussing, and demonstrating techniques. I use the other half for the students to go through hands-on programming exercises. I encourage them to ask their classmates and me for help when they run into problems or confusion. If they are unable to complete everything during class time, I am reachable via email and almost always respond within the day.
3. I tailor the class to different skill levels. I have a baseline set of classwork and homework exercises that I want all students to be able to complete but I also offer optional additional problems for homework for students who are looking for a greater challenge.
4. I use a lot of real-world examples in lectures and assignments that cover the varying disciplines of my students. Students learn how they can use programming to create maps of refugee movement based on data from the United Nations High Commission for Refugees, they apply their knowledge and skills to create an earthquake area of impact estimator based on the USGS Earthquake PAGER, and they create crime trend maps based on data provided by the St. Louis Metro Police Department.
5. I give students the freedom to define their own projects. For several projects, I give students the ability to choose between defining their own project or taking on a project that I have defined. This approach has been very fruitful for students because each student can tailor projects to their own interests. The results have been impressive. For example:
 - Emma Blackwood mapped vacant lots and food desert tracts in STL - <https://bit.ly/2AiV9D7>
 - Wayne Moore mapped Ebola cases in West Africa - <https://bit.ly/2CAfSE2>
 - Lauren Lovato created a 3D map of Mars that includes popups of 3D anaglyph images - <https://bit.ly/2ESZKj7>

When I see beautiful maps, webpages, and results such as the ones listed, I know that my approach to teaching is effective and that my students will be well-prepared for a career in their chosen discipline. Seeing tangible results and seeing the enthusiasm of the students as they work on these projects is what motivates me to teach at Saint Louis University. In my career, I have had some fantastic teachers and mentors. The knowledge and skills they have instilled in me have put me in a position to be a mentor to others. It is my privilege and my goal to provide the education and mentorship to my students to prepare them for their dream job.

STUDENT COMMENTS FROM COURSE EVALUATIONS

GIS 4090/5090

Programming for Remote Sensing-GIS Spring 2018

- “Greg is really fantastic! He was so helpful and patient with all of the students, no matter our experience level. I honestly have no complaints. Great class, wonderful instructor. I’d take classes from him 1000 times over.”
- “I feel that Greg was enthusiastic about teaching us how to write code and was encouraging if we ever ran into issues. I feel like he had good knowledge to provide to us since he works at ESRI and is not only in the academic field.”
- “Great teacher, always there to help”
- “Greg was great about answering emails and being available outside of normal class hours for help.”
- “He was a fantastic instructor and a very patient man. I would suggest him for another course”
- “Greg was very respectful, insightful, enthusiastic.”
- “He is an energetic and happy person. Thanks to Gregory for giving us such a wonderful course.”
- “very knowledgeable on the subject and taught in a way that was easy to understand.”
- “Very accommodating and he knows the programming very well!”
- “I thought the course was great and exactly what I was looking for in a programming Python course.”
- “Great class, no need to change”
- “...it was a fantastic course to enable programmers to use ArcGIS more effectively”
- “I really enjoyed this course! It was challenging to code for the first time, but the material was presented well. The projects were difficult but doable and really forced you to think. Some homework assignments required just repeating information from the book, but I can’t think of a different way to learn some of the material. Overall, it was a great class. I wish that I had more time to spend with the material, but that is no fault of the instructor or the course.”
- “This was a very well planned course. It was paced well and was engaging throughout.”
- “Great course—I was a bit intimidated at first but it went at a nice pace that I could handle.”
- “I enjoyed this course, and like that I am able to apply the knowledge I gained to my current job and career. I feel that it had a good balance of assignments and projects.”

GIS 4091/5091

Advanced Programming for GIS

Fall 2018

- “Course was fun, the content was interesting. Would highly recommend this course for individuals who are serious about advancing their GIS developing skills.”
- “I thought that this class was very interesting and useful, and liked that we were able to learn more topics than what was covered in the intro class. Learning the web-based stuff was fun and helpful, it seems like a good option if presenting any kind of data or maps. I hope to use what I learned in the future! I really liked this class!”
- “Love the Tegrity recorded lectures and I’m glad to have been exposed to Jupyter notebooks.”
- “It was very clear the instructor enjoys the subject and encouraging students to become enthusiastic too.”
- “He always seemed excited to teach us new and cool things”
- “Instructor always provided feedback for both informing us of good work or if there could be improvement”
- “Always took time to answer our questions and listen to any concerns/issues we had”
- “Instructor did his best to respond to students in a timely manner.”
- “This was a good class. Thank you for the semester. It was fun!”
- “Awesome class, thanks Greg!”