University of North Florida

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Spring February, 2018

2017 Florida Data Science for Social Good (FL-DSSG) Annual Report

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Florida
Data Science
for Social Good

Non-Profit Center for Northeast Florida

2017 FL-DSSG Funder Report

February 2018

Table of Contents

Executive Summary

The Florida Data Science for Social Good (FL-DSSG) Program is a summer internship program that matches data science expertise with real-world problems. The FL-DSSG program works with community organizations who are trying to affect change in their communities and who have data management, analysis, and data visualization projects that have the potential to shift understanding around a community issue, influence planning, revise practices, or see efforts in supporting community initiatives more focused or renewed. The mission of the FL-DSSG is to promote data-informed approaches and partners and the partners who use these approaches solve wicked social problems while creating educational programs for aspiring data scientists.

During the 2017 program, the FL-DSSG received $20,000 seed funding from the Nonprofit Center of Northeast Florida. Funds supported stipends for 5 DSSG Interns, who worked 20 hours per week for 10 weeks on 3 DSSG projects. Three non-profit organizations participated in the 2017 program: Changing Homelessness, Mayo Clinic Wellness Rx, and Yoga4Change. The Changing Homelessness project included building profiles of individuals who visited homeless shelters in the Northeast Florida region. DSSG Interns developed a "dignity index" used to identify individuals who are in need of rapid rehousing. The Mayo Clinic project involved creating a data-driven decision tool to support community health program selection and coordination in Duval County. DSSG Interns developed a Tableau dashboard that allowed Mayo Clinic Wellness Rx to compare and contrast neighborhoods based on health disparities and community assets. The Yoga4Change project focused on determining whether trauma-informed yoga practices produced intended results. DSSG Interns' analysis revealed that Yoga4Change participants experience dramatic improvements in blood pressure and mood as well as reductions in stress levels.

On August 7th, 2017, the FL-DSSG team presented the findings of these projects to the Jacksonville community in a culminating event called "Big Reveal." There were over 100 community members in attendance. The videos of the presentation can be found on the FL-DSSG YouTube channel (included at the end of this report).

The success of the FL-DSSG program in its inaugural year would not have been possible without the generous support, confidence, and guidance of the CEO of the Nonprofit Center, Rena Coughlin. We would like to thank the staff of the Nonprofit Center for supporting the program efforts and helping to organize the "Big Reveal" event. Critical support for the program was provided by industry Sherpas (mentors), Faculty Leads, the FL-DSSG Advisory Board members, and UNF administrative and support staff. With these collaborative and cooperative efforts, we have and will continue to make meaningful impact in our communities.

"We are social trustees of knowledge with a unique capacity to do social good."

About FL-DSSG

The Florida Data Science for Social Good (FL-DSSG) program blends data science and technology design to inform and solve important social problems in Northeast Florida. We accomplish this goal by partnering with local non-profit and governmental agencies, analyze their data, and find impactful solutions to social issues. The FL-DSSG program provides internship opportunities for students from diverse disciplines to work on these data science projects along with our community partners. FL-DSSG program offers local non-profit organizations data analysis and data visualization reports to support their work in the Northeast Florida community.

FL-DSSG is hosted at the University of North Florida (UNF). The FL-DSSG program is inspired and modeled after other successful DSSG programs in Chicago and Atlanta. The FL-DSSG program at UNF is being spearheaded by Dr. Dan Richard, Associate Professor in Psychology, and Dr. Karthikeyan Umapathy, Associate Professor in Computing. Over the past five years, Dr. Richard has been helping various non-profit/government agencies with data analysis as well as visualization and interpretation of the results. Dr. Umapathy has worked with local non-profit/government agencies for the past five years in developing technology solutions to improve program efficiencies.

FL-DSSG program has formed a 3-member industry advisory board to seek guidance from experts with in-depth knowledge of data science and STEM workforce readiness. Advisory board members provide recommendations to program directors on project selection and recruitment of mentors, help identify resources for the FL-DSSG program, assist with other relevant program activities, and advocate for the success of the FL-DSSG program. FL-DSSG advisory board membership will be a voluntary service. 2017 FL-DSSG advisory board members are: Jennifer Chapman, Director of Public Affairs from Fidelity Investments in Florida, Robert March, Chief Technology Officer from NLP Logix, and Arri Landsman-Roos, Director of Analytics from Jacksonville Jaguars.

2017 Pilot FL-DSSG program was made possible by generous support of $20,000 from the Nonprofit Center for Northeast Florida. Funds from the nonprofit center supported DSSG internship opportunities for students and other expenses associated in the start-up of this program. Seed fund provided by the Nonprofit Center helped in supporting five DSSG interns impacting three nonprofit organizations.

Summer Internship

The FL-DSSG program is an intensive, ten-week paid summer internship experience. DSSG interns are placed on multi-disciplinary teams and matched with mentors to address real-world problems for

our clients in the Northeast Florida region. The 2017 FL-DSSG summer internship program started on the first week of June and ended on the second week of August. Interns received valuable experience with data management, analysis, technology, and community needs. Interns were supervised by DSSG program directors, and received guidance from industry mentors as well as faculty project leads.

2017 DSSG Interns

For the 2017 pilot program, we recruited five UNF students (3 Psychology Master's students and 2 Computing undergraduate students) as DSSG interns, see listed below.

- Rachel Carpenter, Psychological Science, Master of Science Student
- Evan Copello, Psychological Science, Master of Science Student
- Hinal Pandya, Information Science, Bachelor of Science Student
- Gregory Rousis, Psychological Science, Master of Science Student
- Jason Smith, Computer Science, Bachelor of Science Student

DSSG Intern Responsibilities

FL-DSSG interns were expected to provide a wide variety of data science services, including data mining, data analysis, data visualization, and assisting in data-driven decision-making. The work of the FL-DSSG interns include the following:
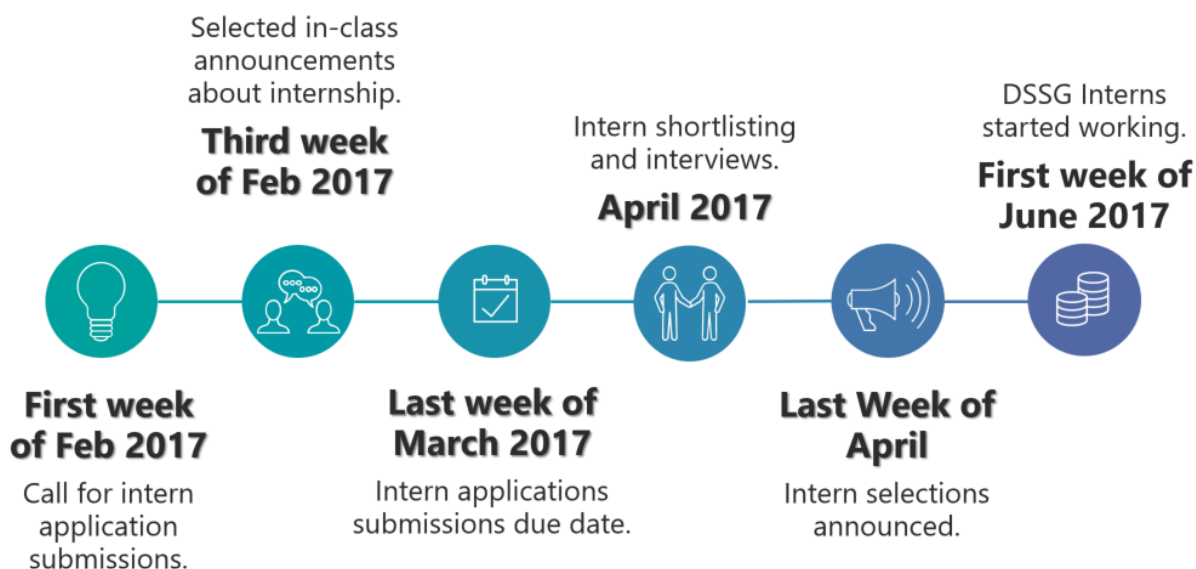
- Work towards understanding Community Partner needs and developing a data science product or report that addresses the identified problem;
- Help Community Partner understand the data-driven decision-making process used in relation to addressing the identified problem;
- Analyze the problem context and meaningfully document the identified problem;
- Document data specifications, analysis approaches, and findings associated with the project;
- Maintain regular communication with the Community Partner, Program Directors, Faculty Leads, and Professional Mentors (aka Sherpas) to obtain feedback on progress made;
- Collaborate with team members oriented toward the success of the projects using project management toolsets provided within the FL-DSSG program;
- Work within regularly scheduled timeframes of Monday, Tuesday, and Wednesday from 9:00 a.m. through 1:00 p.m. each day, and to work within flexible hours for the remaining 8 hours, within each week of the program;
- Notify Program Directors of any conflicts of interest, project impediments, and unethical behaviors within the scope of the FL-DSSG program immediately upon the occurrence of the relevant incident;
- Maintain confidentiality of data and products associated with the FL-DSSG program and maintain professional and ethical conduct with all parties involved; and

- Provide a concluding presentation that outlines all relevant findings and provides concluding recommendations to the Community Partner.

Selection Process

DSSG intern selection process started in early February 2017. We contacted instructors of courses that dealt with data mining, statistical analysis, and research methods in UNF, and requested instructors to post information about DSSG internship. Interested students submitted internship applications via Qualtrics questionnaire. By the end of March 2017, we received 26 applications. Based on the project needs and required skill sets for those projects, we interviewed 11 applicants during first and second weeks of April. Based on the interview performance and information gathered, we offered internship to 7 applicants. 20-hours-per-week internships were offered to 5 applicants and 10-hours-per-week internships were offered to 2 other applicants. 10-hours internship offers were rejected by those 2 applicants. The 20-hours internship was accepted by the other 5 applications, who are listed in the above section. DSSG interns started their work on the projects during first week of June 2017. See Figure 1 for the timeline followed for intern selection.

Figure 1: DSSG Intern Selection Timeline

Selected in-class announcements about internship.
Third week of Feb 2017

Intern shortlisting and interviews.
April 2017

DSSG Interns started working.
First week of June 2017

First week of Feb 2017
Call for intern application submissions.

Last week of March 2017
Intern applications submissions due date.

Last Week of April
Intern selections announced.

Sherpas and Faculty Leads

Data Science is an evolving field; thus, success of data science projects depends upon using current industry best practices. FL-DSSG relies on its industry Sherpas and faculty leads to provide industry best practices and guide DSSG interns to ensure the produced output is of quality and successfully creates intended effects for the client organization. Sherpa and faculty leads work along with program directors to mentor interns and provide technical guidance on the project tasks. In 2017 program, DSSG interns were mentored by 2 industry Sherpas and 3 faculty leads listed below. Sherpas and faculty leads meet DSSG interns on weekly basis for one hour during the 10-week

internship period. During these meetings intern report progress made on the project and mentors provide their guidance on performing analysis, insights on what to look for, and shared tips on improving the project work.

2017 Sherpas (industry mentors) were:

- Jay Lewis, Digital Insights & Analytics Manager at EverBank
- Kellen Blumberg, Manager of Advanced Analytics at Jacksonville Jaguars

2017 Faculty Leads were:

- Dr. Emma Apatu, Assistant Professor, Department of Public Health, Brooks College of Health
- Dr. Sandeep Reddivari, Assistant Professor, School of Computing, College of Computing, Engineering, and Construction Management
- Dr. Bogdan Visinescu, Visiting Assistant Professor, Department of Mathematics, College of Arts and Sciences

Projects

The 2017 FL-DSSG program sponsored 3 community partner projects: Profiles of Chronically Homeless in Northeast Florida (Changing Homelessness); Wellness Rx Community Health Decision Tool (Mayo Clinic); and Mental and Physical Health Impacts of Trauma-Informed Yoga Practice (Yoga4Change). These projects will be described in turn.

Project Selection Process

Partner projects are selected based on their fit with the data science approach and based on the potential impact of the project on the health and welfare of the community. The features of a successful partner project are:

1. **A wicked problem** – data science projects attempt to address a wicked problem - a vexing, persistent social or cultural issue that is complex in nature, interconnected with other problems, and requires many people working together to affect change. Projects could address wicked problems in one of several areas, including education, the environment, government services, health care, healthy living, safety/security, smart urban development, social & economic inequality, and sustainability.
2. **A committed team** – attractive project partners will have organizational leaders who are committed to solving these wicked, real-world problems and who are supportive of using evidence to make important decisions around social good initiatives. Project partners will provide a dedicated staff person in the organization who is willing to work weekly with data science students and mentors on the data science project.
3. **Relevant data and lots of it** – An essential component of any data science project is, obviously, data. Data can take many forms. The project data must represent the complexity of the wicked problem. Data might come from the project partner organization or from other publically available sources, or both. The size and complexity of the data must provide

an adequate experience for students to learn data science techniques and to have relevance for addressing the wicked problem.

4. **A landing pad** – DSSG projects generate products that are useful for participating organizations, partners, and communities. These products often go beyond a single report or project summary. The FL-DSSG Directors and Mentors will work with participating project partners to ensure that the organization has the computing, data, and staff infrastructure to support the delivery of the data science project products.

In collaboration with the funder, the Nonprofit Center of Northeast Florida, the FL-DSSG program hosted a partner information session to provide potential program partners with information about the program and on how they could apply for project selection. Potential partners completed an online application and the FL-DSSG Directors conducted interviews with all applicant organizations. The final list of three organizations were selected based on the suitability of the project and partner based on the timeline, resources, and goals. All project partners were selected by April 28, 2017. Figure 2 provides a timeline of the partner selection process.

Figure 2: Partner Selection Timeline

Call for Proposals	Information Webinar	Proposal Deadline	Partner Interviews
January 2017	February 16, 2017	February 28, 2017	March 2017

Changing Homelessness Project

The Florida Data Science for Social Good (FL-DSSG) program paired with Changing Homelessness Inc. to address the wicked problem of eradicating homelessness in downtown Jacksonville. The goal of Changing Homelessness is to reach effective zero (or functional zero), the situation in which communities have a greater outflow of homeless individuals (housing) than inflow (households becoming homeless) monthly. As part of the project, the FL-DSSG program participants analyzed client data from the Homeless Management Information Systems (HMIS; N=692) and client data from the Vulnerability Index – Service Prioritization Decision Assistance Tool (VI-SPDAT; N=192) from three local homeless shelters: the Sulzbacher Center, the City Rescue Mission, and the Salvation Army. Using multiple analytic techniques, we found three main categories of individuals that are facing homelessness: a "health concern" group, those experiencing a social concern only, considered to be "situational" homeless, and those who experience a health concern as well as a social concern, identified as "most vulnerable." Those in the most vulnerable category should be triaged immediately, while those facing a health concern may need more emergency and medical services. Individuals classified as situational may be facing more individualistic, less common

problems. In creating these clusters that mainly came from the VI-SPDAT data, we derived several questions that we believe should be integrated into the HMIS to better triage individuals into the most appropriate form of housing. In addition, we developed a ten-item, four factor structure dignity index that includes factors such as feeling respect (from others and for oneself), having a sense of control over one's life, and having a meaningful daily activity. These pieces of information can be important in determining the vulnerability of homeless individuals and allow case managers to respond to the specific needs of these individuals quickly and efficiently.

Mayo Clinic Project

The Mayo Clinic is a large hospital group that serves over a million individuals from across the nation and 137 countries worldwide. The Mayo serves over 1-million people in Jacksonville, alone. The Mayo Clinic Jacksonville, launched Wellness Rx in response to the 2016 Community Health Needs Assessment (CHNA) regarding health disparities in the community. This assessment is provided every 3-years by 6 non-profit hospitals in the City of Jacksonville, Florida. The first phase of the Wellness Rx program is a collaboration with New Town Success Zone and focuses on the New Town neighborhood adjacent to the Edward Waters College in Duval County. The Mayo Clinic's Wicked Problem was choosing a location for their next phase of Wellness Rx. Using Census Tract health data from the 500 Cities Project (Center for Disease Control, 2015), researchers could identify other neighborhoods that could benefit from the resources provided by Wellness Rx. An online tool was created that would allow decision makers to view an interactive map, viewing health disparities by Census Tract. This tool provides a sophisticated decision-making tool for Mayo Clinic, as well as other service providers around the country, to target neighborhoods in Jacksonville that are in most need of health services.

Yoga 4 Change Project

Yoga4Change is a non-profit organization that achieves meaningful change for veterans, incarcerated individuals, vulnerable youth, and those dealing with substance abuse. Their purpose-driven yoga curriculum has the vision to heal and empower these underserved populations, creating healthier and safer communities. Their goal is to give hope, self-esteem, and confidence through the integration of yoga into individual lives. Along with the curriculum, Yoga4Change started collecting self-reported notecards for stress and mood levels of students before and after each session in 2016. Since 2017, they partnered with Head Start to collect data on participants' blood pressure as well as heart rate. Their main wicked problem is to analyze the effect of yoga on individual's subjective levels of stress and mood as well as on objective measures of blood pressure and heartrate. Moreover, because Yoga4Change data was entered manually in a Microsoft Excel file from participant completed notecards, another wicked problem was to create a new way to collect and organize their participant data. Analyses demonstrated a substantive decrease in stress and increase in mood across all populations taking yoga. In addition, most participants experienced a decrease in blood pressure following yoga sessions. The Florida Data Science for Social Good team provided a

tool to Yoga4Change for data entry purposes. This tool will benefit Yoga4Change by allowing them to more systematically collecting data about participant health related to yoga practice.

The Big Reveal Event

FL-DSSG hosted its inaugural Big Reveal event on Monday, August 7 at the Nonprofit Center of Northeast Florida here in Jacksonville. The event marked the culmination of the summer internship program offered by UNF in collaboration with the Nonprofit Center. At the event, FL-DSSG interns presented findings and reveal insights gained from the Mayo Clinic, Changing Homelessness, and Yoga 4 Change projects. The event was attended by over 100 individuals from nonprofit sector. Project presentation was video recorded and it can be viewed at the FL-DSSG You Tube channel at: https://www.youtube.com/channel/UCcXKi-04zVU6g4UpeeNCA6Q

Budget

2017 FL-DSSG pilot program was funded by the Nonprofit Center of Northeast Florida with a gift of $20,000. Funds were used to pay DSSG intern stipends as a compensation for their work.

Program Sustainability

FL-DSSG Program Directors are actively pursuing various ways to obtain funding to continue the program beyond its inception. Directors are seeking grant opportunities within UNF as well as external federal grants. UNF and the Nonprofit Center are working together to raise funds from community members in the region. Directors are working to create the administrative structures necessary to sustain the program as functioning unit within UNF.

The FL-DSSG team are working alongside UNF administrators to develop a university-wide DSSG traineeship program that will help develop the data scientist workforce in our region. This investment will provide sustainable returns in the form of quality DSSG Interns. Our hope and plan is that these initiatives will support the sustainability of the FL-DSSG program.

Conclusions

The ability to affect change and do good in one's community increasingly depends on having the right information at the right time to make the right decisions about things that are most important. Directors of community programs as well as funding agencies want evidence of impact and demonstrated efficiency in programs that serve our communities. Often, the information available to meet these needs are not well organized, not well understood, and not packaged in a way that helps those working in the community do their best.

The FL-DSSG program was formed to address a lack of data scientist capacity within the nonprofit sector and to use these data science projects as an opportunity to train students from diverse backgrounds to be a data scientist. In its inaugural year, the FL-DSSG program worked with three non-profit agencies in the North Florida region to support their data science needs in service to addressing the region's persistent social problems. In addition, five UNF students were trained to use data scientist skillsets for solving social good problems.

FL-DSSG program had considerable impact on all three participating organizations. Tableau Dashboard developed for Mayo Clinic now can be used for making data-driven decisions as opposed to selecting neighborhoods arbitrarily. Dignity index developed based on homelessness profile data helps Changing Homelessness to more effectively identify individuals who are in need of rapid housing. Data analysis results for Yoga4Change project helped them to secure necessary resources for expansion of trauma-informed Yoga program.

There is a growing demand for trained data scientists who can develop data-driven problem solving approaches to resolve our social issues. Through this inaugural offering of FL-DSSG program, we learned the extensive need of this program for our region but also there is vested interest in the community for this program to succeed beyond its first year. We were fulfilled in discovering the mutual interest and benefit our community partners, industry partners, faculty, and students experienced through the program. Together we worked as social trustees of knowledge, each of us contributing our wisdom and time to address pressing social issues in our community.

Get More Information

For additional information about the FL-DSSG program; its process, methodologies, tools, and techniques; and how to participate with the program contact FL-DSSG program directors. Visit FL-DSSG website for contact information.

2017 FL-DSSG program was funded by the Nonprofit Center for Northeast Florida.

2017 FL-DSSG Big Reveal Presentations

2017 Big Reveal Presentation Video: https://www.youtube.com/watch?v=R9HdJfCshCs

SlideShare Presentation File: http://bit.ly/2017FLDSSGSlides

Event Pictures: http://bit.ly/17DSSGRevealFBPics

2017 FL-DSSG Interns

Rachel Carpenter, Master of Science - Psychological Science

Evan Copello, Master of Science - Psychological Science

Hinal Pandya, Bachelor of Science - Computing and Information Sciences

Gregory Rousis, Master of Science - Psychological Science

Jason Smith, Bachelor of Science - Computing and Information Sciences

FL-DSSG Program Directors

Dr. Dan Richard, Associate Professor, Psychology Department

Dr. Karthikeyan Umapathy, Associate Professor, School of Computing

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