

CaRDS -Meeting

Minutes

February 8, 2021, 11:00 am

Virtual Meeting

Present: Brian Bennett (Computer Science), Frank Hagelberg (Physics and Astronomy), Dana Harrison (Management and Marketing), Michele Joyner (Math and Statistics), Muhammed Khan (Computer Science), Janet Keener (Information Technology Services), Robert Price (Math and Statistics).

The conversation centered on possible activities in preparation for the new Master's degree in Applied Data Science (M.S.A.D.S.). Further, we touched on new initiatives aimed at sustaining research computing at ETSU.

Main conversation items:

- Timeline for the further review of our M.S.A.D.S. proposal.

The Letter of Notification (LON) has passed through all stages of assessment within the ETSU campus. It was last discussed by the Academic Council (11/12/20) and the University Council (12/14/20). It is scheduled for consideration by the Board of Trustees on 2/29/21. The earliest date for its presentation at the Tennessee Higher Education Commission (THEC) is 5/20/21. As pointed out by Brian, we are likely to receive questions from THEC about the LON prior to that date. If THEC approves our LON we'll submit a New Academic Program Proposal (NAPP), to be reviewed within ETSU. A THEC site visit will follow and, in the positive case, a final evaluation by THEC. That this sequence of events will be completed by the fall of this year seems unlikely. More realistically, the inception time of our program is fall 2022.

- Projects in preparation for the M.S.A.D.S.:
 - Assigning the core courses of the program to faculty of the Math/Computer Science departments
 - Converting core courses from on-ground to on-line

In the wake of the current crisis, attitudes towards on-line teaching have been changing. In particular, many teachers have adapted their courses to on-line formats, both synchronous and asynchronous. While, one year ago, the expectation of on-line options for all courses of our program appeared like a major challenge, recent experience has shown that this condition may be met without inordinate effort. Previously, we considered making streamed class sessions available to off-campus students. Now, offering on-ground classes with synchronous remote participation through Zoom or Panopto appears to be a preferable alternative.

- Advertising the program
- Reviewing the electives in terms of on-line versus on-ground instruction

In the list of electives, we should identify courses that are taught solely on-ground so far, or will return to pure on-ground delivery after the end of the crisis. We might contact the respective instructors and ask if on-line accommodations could be made for interested M.S.A.D.S. students. As, in all likelihood, our students won't take elective classes prior to fall 23, this item is not of immediate urgency.

- Designing boot camps,

Several questions were raised concerning the boot camps that would allow candidates for our program to increase their knowledge and skill in math, statistics, and programming in order to meet the requirements of the program. Outlining the organization of the boot camps is among the tasks to be addressed while our program is under consideration. Some suggestions were made:

- The boot camps might be taught, or administered, by departmental staff during the summer terms,
- The courses may employ on-line programs, for instance on Python or R,
- There should not be any extra cost associated with these courses, i.e. any student accepted into our program should be given the opportunity to take these courses.

- Planning joint projects with Ballard Health and other local employers

Last year we started a dialogue with Ballard regarding internships for our students (see the minutes of the CaRDS meeting on 1/ /20). In particular, the issue of Ballard data security was discussed. Ballard, as represented by Dr. Matthew Loos and Mr. Jason Carter, suggested that the student work associated with Ballard internships should be done on Ballard premises. An alternative might be to create an office space with dedicated ETSU computers on the ETSU campus. These computers would have no online access, nor would they have any capability for copying the data stored on them onto a drive. IT personnel of ETSU and Ballard would cooperate to assure that Ballard's data are secure on these computers. This, we believe, would be an excellent option for our students, as it would enable them to pursue their projects outside of typical Ballard working hours, and thus add schedule flexibility.

Michele provided information on data security practices accepted by Ballard in the context of the PICMath course she taught in the fall of last year. A secure dropbox was used for data transfer to students interacting with Ballard, and the transferred data were erased at the end of the course.

The Ballard internships might set a model to be followed when interacting with other local employers.

- Assessing computation needs

The computation needs of our students are expected to vary significantly with the nature of their internship programs. The proposed budget for our program contains a computing line item of \$10,000 annually. Further estimates are needed to assess if this figure is sufficient.

At this juncture, a likely computation platform for our students is offered by Amazon Web Services (AWS). AWS provides on-demand cloud computing platforms to individuals, companies, and administrative units. In particular, the Amazon Elastic Compute Cloud (EC2) that allows users to run their own computer applications on virtual computers, is open to ETSU researchers on a pay-as-you-go basis. ETSU currently benefits from the AWS Educate program which offers student research credits and also supports teaching faculty. A modest amount of computing funds is free of charge.

Mondays at 11.00 am or 12.00 pm appear as favorable time slots for further CaRDS meeting this semester.

The meeting adjourned at 12.00 pm.

Among the local employers that have agreed to host internships for our students, B

- *Ballad as part of the M.S.A.D.S. curriculum.*
- *Real-world projects to be provided by Ballad for students of Applied Data Science.*
In the second year of the M.S.A.D.S. program, the students will interact with local companies on data-related projects. A company assigns a task to a team of two students and provides them with relevant data sets. This mode of practical learning has been pioneered at ETSU by Michele Joyner's PIC-Math (Preparations for Industrial Careers in Mathematical Sciences) course. Recently, students of this course have performed a risk stratification project at Ballad under the guidance of Jason Carter. This cooperation might serve as a model for future interactions between the M.S.A.D.S. at ETSU and Ballad Health

Compliance issues will have to be faced prior to releasing health-related data to our students. These problems may be addressed by granting the students access to Ballad-owned data only while they are on Ballad premises.

As suggested by an estimate based on a recent ETSU student survey, about seven projects for teams consisting of three or four students might have to be offered in any given semester. It was mentioned that Ballad may contribute up to six projects per year.

- *Hosting data science interns.*
Ballad may accommodate M.S.A.D.S. students as interns for longer periods, such as a summer term. The students would work for some months continuously on data-related tasks posed by Ballad.
- *Designing the health sciences concentration of the M.S.A.D.S.*
Ballad will make recommendations related to the curriculum of the concentration in health sciences to align it closely with the actual needs of local healthcare institutions.
- *Ballad as a potential funding source for the M.S.A.D.S. at ETSU.*
- *Funding by the Center for Rural Health Research.*

Ballad committed a sum of \$15 million over the next ten years in support of the newly founded Center for Rural Health Research, housed by the ETSU College of Public Health. Data science/analytics will naturally play a major role for the research pursued in this center, in terms of acquiring reliable health-related information, developing and assessing remedial strategies etc. CaRDS will be in contact with Dr. Randy Wykoff, Dean of the College of Public Health, about funding opportunities that may come from the Ballad investment.

- *Direct funding by Ballad Health.*
Proposals may be addressed directly to Ballad Health. These should outline in what ways the requested items will be mutually beneficial. In support of the M.S.A.D.S., Ballad might fund one or several graduate assistantships. Further it might provide funds for the directorship of the program. In this context, the possibility of creating an endowed chair for data science at ETSU was mentioned.
- *Support for Ballad employees as M.S.A.D.S. students.*
Ballad may provide funding for employees who want to enroll in the M.S.A.D.S. program. An online component will help these employees to reconcile their responsibilities at Ballad with the demands of the ETSU. Such a component is currently in the planning stage.
 - *Timeline*
- At this juncture, CaRDS finalizes the Letter of Notification (LON) for the M.S.A.D.S., to be sent to the Tennessee Higher Education Commission (THEC). Submission is planned for February 2020.
- After approval of the LON by THEC, a more detailed proposal for establishing the new program at ETSU will have to be accepted by ETSU. Subsequently, we will be in contact with Ballad about funding opportunities.
- The program is expected to start in the fall semester 2021. At that time, we will begin discussing with Ballad specific assignments to be completed by our first students in their second year.
- In the fall semester 2022, the first M.S.A.D.S. cohort will be ready to start interacting with Ballad.

The meeting adjourned at 12.00 pm.