

# Faculty Development Plan

May 11, 2020

## 1 Teaching

### 1.1 Self-Assessment

I like teaching and interacting with students. I received average or good student ratings during my first year, depending on the course. Overall, I think I am a pretty good teacher with room to improve. I worry that I am not always explaining things clearly to the class. In my probability class, I found it difficult to engage the students, making it hard to know whether they were understanding. Like many professors, I'm not sure how to appropriately incorporate gospel topics into the classes I teach.

Before my first year, I did not have an exact idea of how I wanted to teach Stat 330 and 641, so I borrowed a lot of ideas from my colleagues who previously taught these classes. Although I think both courses were good, I feel like I need to do more to adapt the classes to my style. Several of my goals for the coming year focus on that.

### 1.2 Goals for 2020/2021

- Stat 641 - In order of my priority
  1. Develop at least one interactive section for each lecture so that the students don't get bored.
  2. Improve the homework to meet learning outcomes.
  3. Reduce the time spent on review topics.
  4. Bring in some appropriate non-Casella&Berger Material that may be interesting. I've thought about spending an extra week on multivariate distributions to talk about DAGs and related probability ideas. I thought I may also talk about positive-definite functions.
  5. Prepare a learning-centered syllabus.

6. Sit in on 340 classes to see how professors involve students
- Stat 330 - In order of my priority
    1. Reduce some of the extra topics that I chose to teach in favor of spending more time on theory.
    2. Improve the homework to meet learning outcomes, including more explicit theoretical work.
    3. Update some of the motivating datasets to those I have spent more time working with.

## 2 Scholarship

### 2.1 Self-Assessment

I enjoy working on scientific problems that do not have simple statistical solutions. I am not very interested in statistics or probability for its own sake, although I certainly have some projects of this flavor. I would like to do fewer of these things, but I have some momentum in these areas. So, I feel conflicted about that.

Instead, I enjoy working on challenging scientific data problems. As a part of this, I try to either (1) develop appropriate methods for unique data or (2) identify potential weaknesses in current approaches. For these applied projects, I think that I am good at quickly coming to pretty good solutions that are publishable. For this reason, I am productive. On the other hand, I am sometimes impatient with projects. So, I sometimes favor submitting a paper sooner to a lesser journal rather than spending more time to develop a stronger paper. I want to change this because I think it will be better for my career to develop each paper more, making them stronger and more likely to land in better journals.

### 2.2 Goals

- Resist the urge to submit something just because it is publishable. Instead, let projects mature so that I can target better journals.
  1. Submit two papers each year to a top-tier journal: *JASA*, *JRSS-B*, *Biometrika*, *AoAS*, *Technometrics*, or *Bayesian Analysis*.
  2. Say no to projects that I can't see being statistically impactful.
- Move away from the covariance modeling work that I have done. I don't enjoy it as much as the scientific projects that I have been working on
  1. Steer collaboration with Emilio to focus more on compelling applications.

## 2.3 Current Scholarship Work with Comments and Goals

- Manuscripts

- Submitted

1. “Generalized Evolutionary Point Processes: Model Specifications and Model Comparison.” I submitted minor revisions to *MCAP*, a pretty good probability journal, in Feb 2020. The editor said things have slowed with Covid-19.
2. “Multivariate Functional Data Modeling with Time-varying Clustering.” This paper is under review at *TEST*, a good, but not top, stats journal.
3. “Hierarchical Spatial Modeling of Monotone West Antarctic Snow Density Curves.” This paper has been under review at *Annals of Applied Statistics*, a top stats journal, since Jan 2020.
4. “Random Fields on the Hypertorus: Covariance Modeling, Regularities, and Approximations.” This paper has been under review at *JASA: Theory and Methods*, a top stats journal, since Jan 2020.
5. “Multivariate Isotropic Random Fields on Spheres: Nonparametric Bayesian Modeling and  $L^p$ -Fast Approximations.” This paper has been under review at *Electronic Journal of Statistics*, a good stats journal, since April 2020. We tried a couple of top journals without luck.
6. “Regularity and Approximation of Gaussian Random Fields Evolving Temporally over Two-Point Homogeneous Spaces.” This paper has been under review at *Electronic Journal of Probability*, a good probability journal, since April 2020. I played a smaller role than both co-authors

- Near Submitting

1. “Spatially Varying Arrhenius Regression for Modeling Firn Density.” This paper is almost ready to submit. This has some nice methodological and applied contributions. I have to get final results, write a little more, and proofread. I am planning by the end of June (at the very latest) to one of the following: *JASA: Case Studies and Applications*, *Technometrics*, or *Bayesian Analysis*.

- Active Projects - Not all of these represent a large time commitment

1. Model-based space-depth designs for selecting new firn core sites. This is a challenging design problem with many interesting challenges and constraints. I am hoping to keep this a solo

author paper. Given the number of papers under review, I don't have a firm end date on this. I am thinking Dec 2020.

2. Asymmetric error models for robust functional models. This is an applied project with a Master's student Daniel Sheanshang and U of U Geography professor Summer Rupper. Our goal is to finish most of the work by the end of the Summer and submit during Fall 2020.
3. Plant reflectance modeling for predicting environmental traits. The lead on this project is a stats student (Michael Christensen) at Duke. I think I'll probably be the second author.
4. Chemical profiling of river systems. This is with Matt Heiner, Matt Heaton, and Ben Abbot (BYU PWS). Matt Heiner is taking the lead on this project. I think we will likely have submittable work by Dec 2020 - May 2021, depending on the time we have to dedicate to this project.
5. "The Role of Temperature Variation for Reconstructing the Advance and Retreat of Glacial Ice using Thermal and Radar Imaging:" An IDR project with (Geology) Kevin A. Rey and John H. McBride and (Electrical and Computer Engineering) Randal W. Beard Electrical and David G. Long. We are starting work on this Summer 2020.

- Grants

- Funded

- \* "The Role of Temperature Variation for Reconstructing the Advance and Retreat of Glacial Ice using Thermal and Radar Imaging," Brigham Young University Interdisciplinary Research (IDR) Origination Awards, 2020 (Role: Co-PI, Amount: \$119,910).

- In preparation

- \* "Analysis Methods for Multivariate Point Patterns on Linear Networks" was previously submitted to the NSF. We received positive feedback and are retooling it for resubmission.
    - \* "Quantifying Snow and Glacier Response to Climate and Aerosol Forcings in High Mountain Asia," was previously submitted to NASA. We received positive feedback and are retooling it for resubmission.

## **3 Citizenship**

### **3.1 Self-Assessment**

I serve as the department seminar co-chair with Dr. Zabriskie and am on the comprehensive exam committee (I teach Stat 641). I think I have done well in these roles. I think the 2020/2021 academic year will be very interesting with Covid-19. I like my department and BYU and hope that I am a positive contributor to both.

I am willing to participate more broadly in the stats community but haven't done much. I am occasionally asked to serve as a reviewer for academic papers. I volunteered to chair a JSM session this year, but I was told that it likely won't happen.

### **3.2 Goals for 2020/2021**

- Prepare more for departmental meetings
- Volunteer to chair a session next year at JSM
- Be more sensitive to colleagues' workplace preferences.