



FORECASTING STUDENT APPLICATION COUNTS USING HIERARCHICAL BAYESIAN INFERENCE

Assignment

Forecasting how many students sign up for an educational program is an important challenge for many schools and universities. This project is about developing a probabilistic model for student arrival rate, fitting the data day-by-day and using cutting-edge mathematical techniques to forecast final student counts. A key component will be exploring ways to introduce hierarchical dependencies to the mathematical model. For example, the arrival rate might depend on the time of the year, due to high school schedules and registration deadlines. We may also want to account for one-off external factors such as school policy changes. Ultimately, the model should predict, with uncertainty, how many students will sign up for a specific university program. Such a model will assist education coordinators but will also have wider applications in Operations Research.

Activities

The student will iterate over a model design cycle, i.e., build, evaluate, critique, and improve their mathematical model. In each iteration, the student is expected to write probabilistic programs, run simulations, and visualize results. Finally, the student is invited to present their findings to the Mathware Competence Group(s).

Internship overview

- Master Student
- Graduation assignment
- Mathware
- Location: Eindhoven

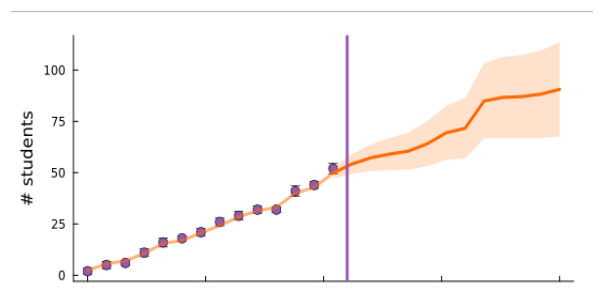
Technologies

- Bayesian inference
- Hierarchical models
- Stochastic processes
- Probabilistic programming



Context.

Students signing up for educational program is an example of an arrival process, where a counter ticks up at random time increments. These increments often follow well-behaved probability distribution functions and are described using probabilistic models. The quality of a model's predictions may be improved tremendously by including factors that affect the process. For example, adding high school schedules from other countries may help predict international students' arrival rate. Sioux Technologies would like to explore novel statistical techniques for designing and fitting such models. We are looking for a student interested in applying techniques from probability and statistics to real-world problems. The prospective intern should have some experience with software development (in Python or Julia), where exposure to probabilistic programs is a big plus. In return, we offer a collaborative, inspiring and fun working environment with highly trained and supportive professionals.



Why choose Sioux?

- Working on innovative technology
- Challenging, dynamic and varied work
- A comfortable and personal work environment
- Plenty of opportunities for personal development
- Great career opportunities
- Contributing to a safe, healthy and sustainable society

Get in touch!

Would you like to know more about this student assignment?

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