DESIGN STUDIES
Miriah Meyer
- WHAT
- HOW
- WHO
- WHEN
what is this course about?
design study

project in which visualization researchers analyze a specific real-world problem faced by domain experts, design a visualization system that supports solving this problem, validate the design, and reflect about lessons learned in order to refine visualization design guidelines
problems that matter

collaboration

iterative design
collaborators

- Dr. Pearl Sandick, particle physics
- Dr. Chris Ball, sociology
- Dr. Ken Smith, population sciences
- Shelby Law, fire forecasting
- Patrick Barickman, air quality
how will the class work?
This course will take students through the process of conducting a design study, which is a problem-driven, collaborative process for conducting visualization research. You will learn how to design a visualization system for a real-world problem taking a user-centered, iterative design approach. Topics covered include methods for interviewing, extracting requirements, rapid prototyping, and evaluating deployed systems. There will be a number of lectures devoted to peer-review workshops.

There are several "collaborators" lined up who have some interesting data analysis challenges and are excited to work with students in the course -- you will select a collaborator and conduct a design study over the course of the semester. The goal of the course is to deploy a visualization system, and, depending on progress, write up the design study as a paper submission to a visualization venue.

### Schedule

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who is here?
Miriah Meyer
assistant professor
School of Computing and Scientific Computing and Imaging Institute
University of Utah
WEB 4887
miriah@cs.utah.edu

born in Martinsville, VA

year 0
dad buys a Commodore64
decide to become an astronaut

decide to become a surgeon

decide to become a surgeon on a space station

start college at Penn State

year 10
start grad school at the U

discover computer graphics, realize CS is cool

software engineer at Raytheon

finish BS in astronomy

year 20
assistant professor at the U in School of Computing and SCI

postdoc at Harvard University

finish PhD in computer science

year 30

YOU ARE HERE
YOU!
when will we meet?
MizBee: A Multiscale Synteny Browser

Miriah Meyer, Tamara Munzner, *Member, IEEE*, and Hanspeter Pfister, *Senior Member, IEEE*

Fig. 1. The multiscale MizBee browser allows biologists to explore many kinds of conserved synteny relationships with linked views at the genome, chromosome, and block levels. Here we compare the genomes of two fish, the stickleback and the pufferfish.

Abstract—In the field of comparative genomics, scientists seek to answer questions about evolution and genomic function by comparing the genomes of species to find regions of shared sequences. Conserved syntenic blocks are an important biological data abstraction for indicating regions of shared sequences. The goal of this work is to show multiple types of relationships at multiple scales in a way that is visually comprehensible in accordance with known perceptual principles. We present a task analysis for this domain where the fundamental questions asked by biologists can be understood by a characterization of relationships into the four types of proximity/location, size, orientation, and similarity/strength, and the four scales of genome, chromosome, block, and genomic.
Process and Pitfalls in Writing Information Visualization Research Papers

Tamara Munzner

University of British Columbia
tmm@cs.ubc.ca, http://www.cs.ubc.ca/~tmm

Abstract. The goal of this paper is to help authors recognize and avoid a set of pitfalls that recur in many rejected information visualization papers, using a chronological model of the research process. Selecting a target paper type in the initial stage can avert an inappropriate choice of validation methods. Pitfalls involving the design of a visual encoding may occur during the middle stages of a project. In a later stage when the bulk of the research is finished and the paper writeup begins, the possible pitfalls are strategic choices for the content and structure of the paper as a whole, tactical problems localized to specific sections, and unconvincing ways to present the results. Final-stage pitfalls of writing style can be checked after a full paper draft exists, and the last set of problems pertain to submission.

1 Introduction

Many rejected information visualization research papers have similar flaws. In this paper, I categorize these common pitfalls in the context of stages of the research process. My main goal is to help authors escape these pitfalls, especially understanding how to select the right type of paper to submit.