Human-Computer Interaction

Week 3 Lecture 3A

Thinking and communicating about HCI design

COMP 3900 & COMP 6390

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Thinking and communicating about HCI Design

We will start by discussing Chapter 6 (Design Thinking) of Donald Norman's book "The Design of Everyday Things" (2013 edition).

We will then look at some tools for use in designing interactive systems:

- Descriptive scenarios
- Early-stage prototypes
- User evaluation

Double diamond design approach

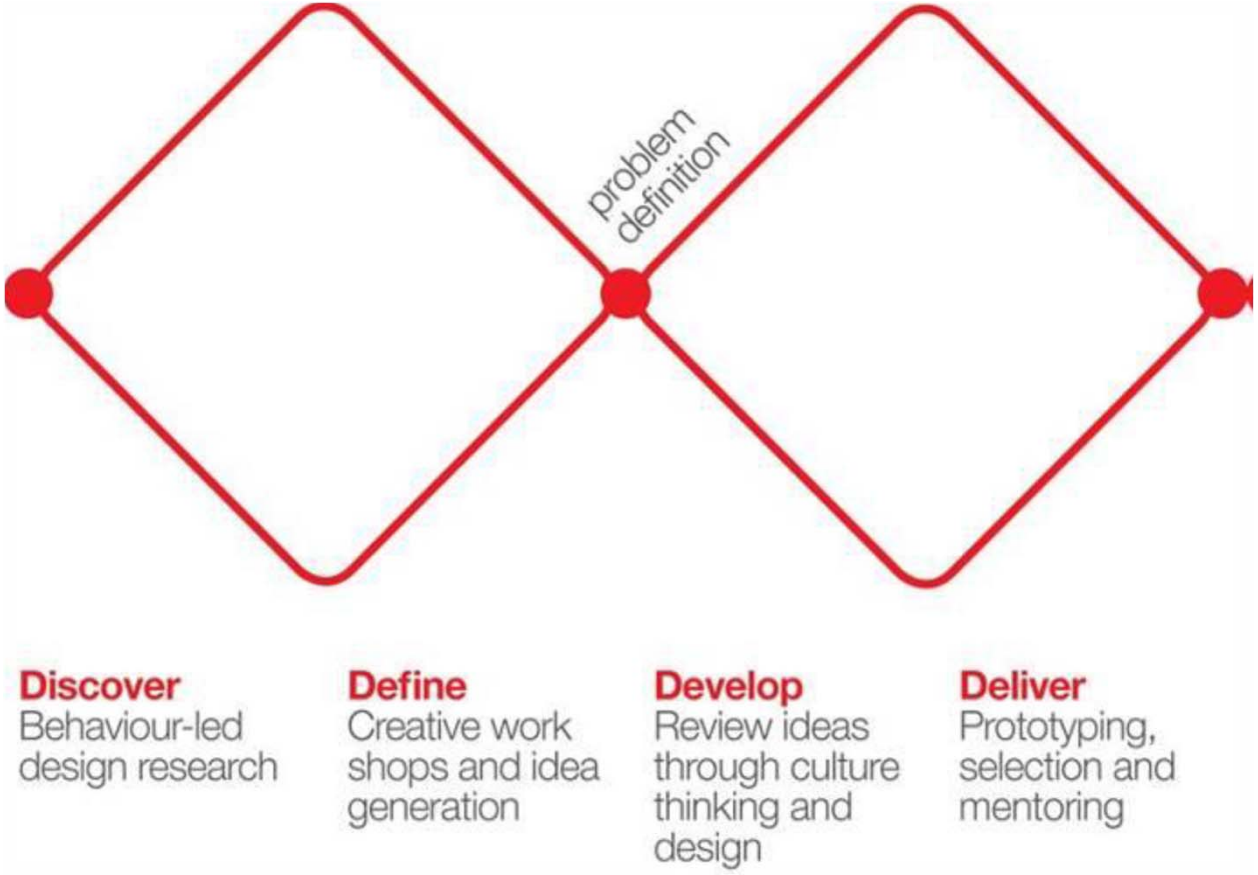
Quotes from Norman's book:

"Good designers never start by trying to solve the problem given to them; they start by trying to understand what the real issues are" (p218)

"Engineers [and business people] are trained to solve problems" (p217). (not sure I agree with the implication that engineers mindlessly solve problems without looking at the whole situation)

Human-Centred Design "solving the right problem, and doing so in a way that meets human needs and capabilities" (p219) (looking at the whole situation for the users)

Double-diamond approach to design



From Taylor et al (2015) "VIRK: Virtual work environment to facilitate interaction between the unemployed", OZCHI Student Design Challenge submission [adapted from the British Design Council 2005]

Double-diamond process

Here is a simplified way of thinking about this process

Discover

Find out what the problems really are

Define

Decide which problem is the important one to be solved

Develop

Explore different ways of solving the problem

Deliver

Bring the pieces of your solution together

British Design Council

Two documents published by the British Design Council:

- Design Methods for Developing Services
- A Study of the Design Process

Both documents are quite long so don't feel you need to read all of each of them.

Iterative design in HCI

At each stage of the design process you can do these steps:

- Gather data about the task
  - Observe, interview, try the tasks yourself
- Generating ideas
  - Research, discussion, brainstorming, large-scale design principles, scenarios, check with users
- Prototyping those ideas
  - Paper (wireframing), simple interactive prototypes, keeping the scope small
- Testing (evaluating) those prototypes
  - Small-scale user evaluations

Industrial example: gold mining

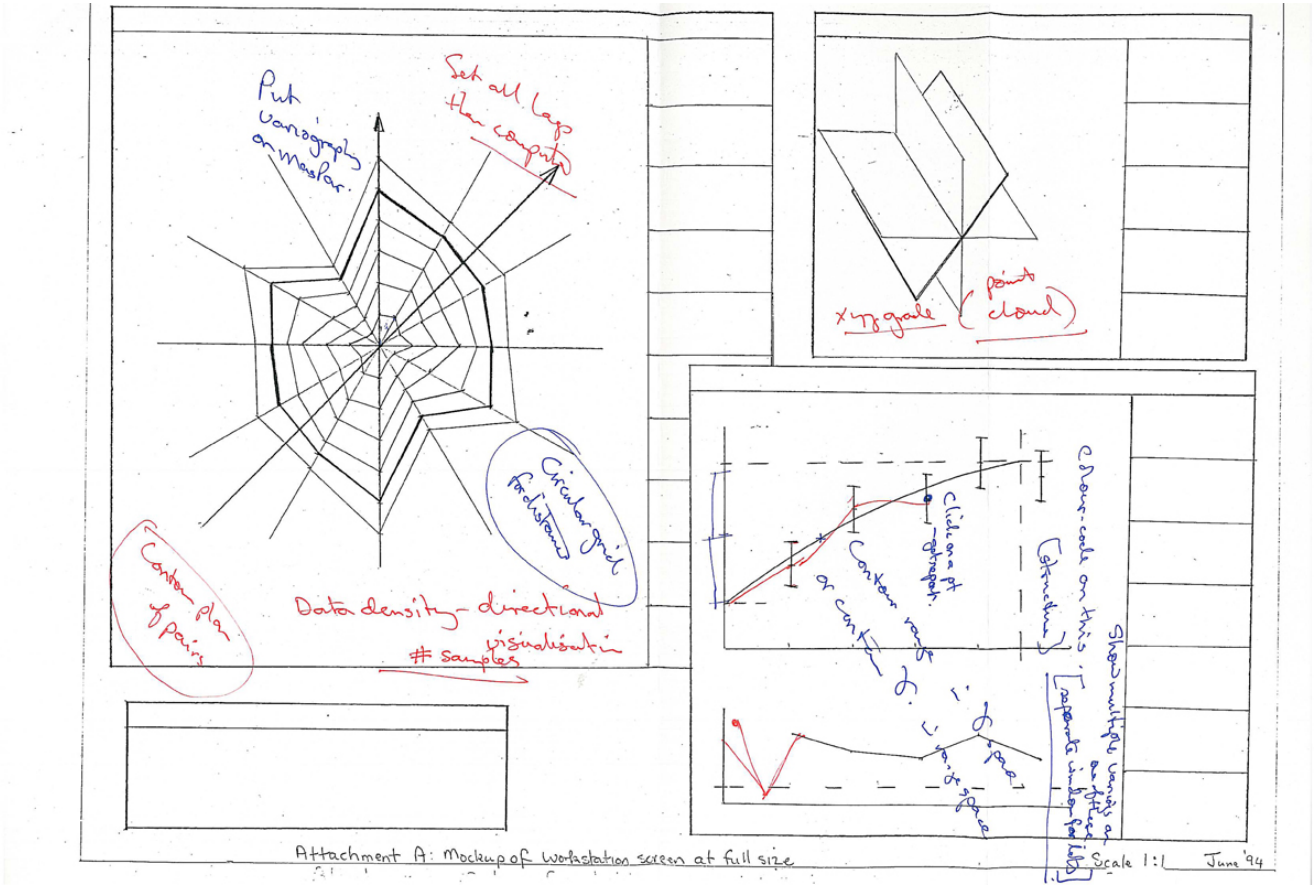
Industrial example: gold mining

- 1993, Windows 3.1 being used by our clients in W.A.
- Super-computer facilities at ANU
- Cooperative Research Centre for advanced computation
- Geo-statistics: studying minerals exploration data on a kilometre-scale to identify ore-bodies
- Three phases of the geostatistics task:
  - Analysis of the raw data
  - Computations to create 3D models of the ore-body
  - Reporting the results to the mining company
- Project proposal was to put the computation step on the super-computer at ANU

Industrial example: gold mining

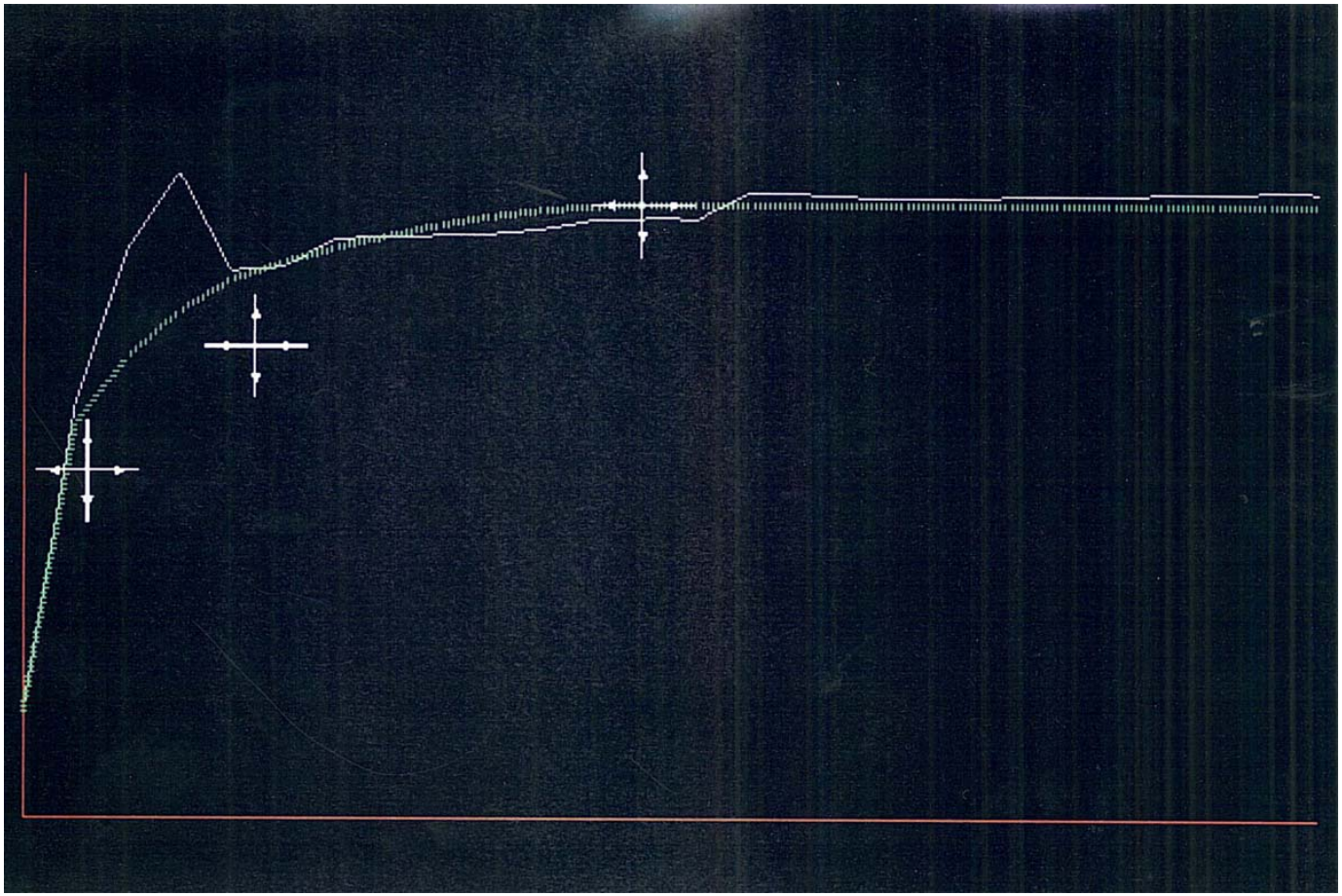
- Discover: Six months spend identifying the real problem. Two main design ideas each based on our experience interacting with three-dimensional data:
  - Interactive 3D representations of the ore-body
  - Interactive visualisation of the raw data and interactive fitting mathematical models to that data (analysis phase)
- Define: Focus on solving the interactive analysis problem
- Develop: Prototype a sequence of solutions to the analysis problem
- Deliver: Focus on the chosen solution and build a full working prototype.

Geostatistics: first paper prototype



A3 diagram attached to a 20-page report describing our understanding of their application problem

Geostatistics: first working prototype

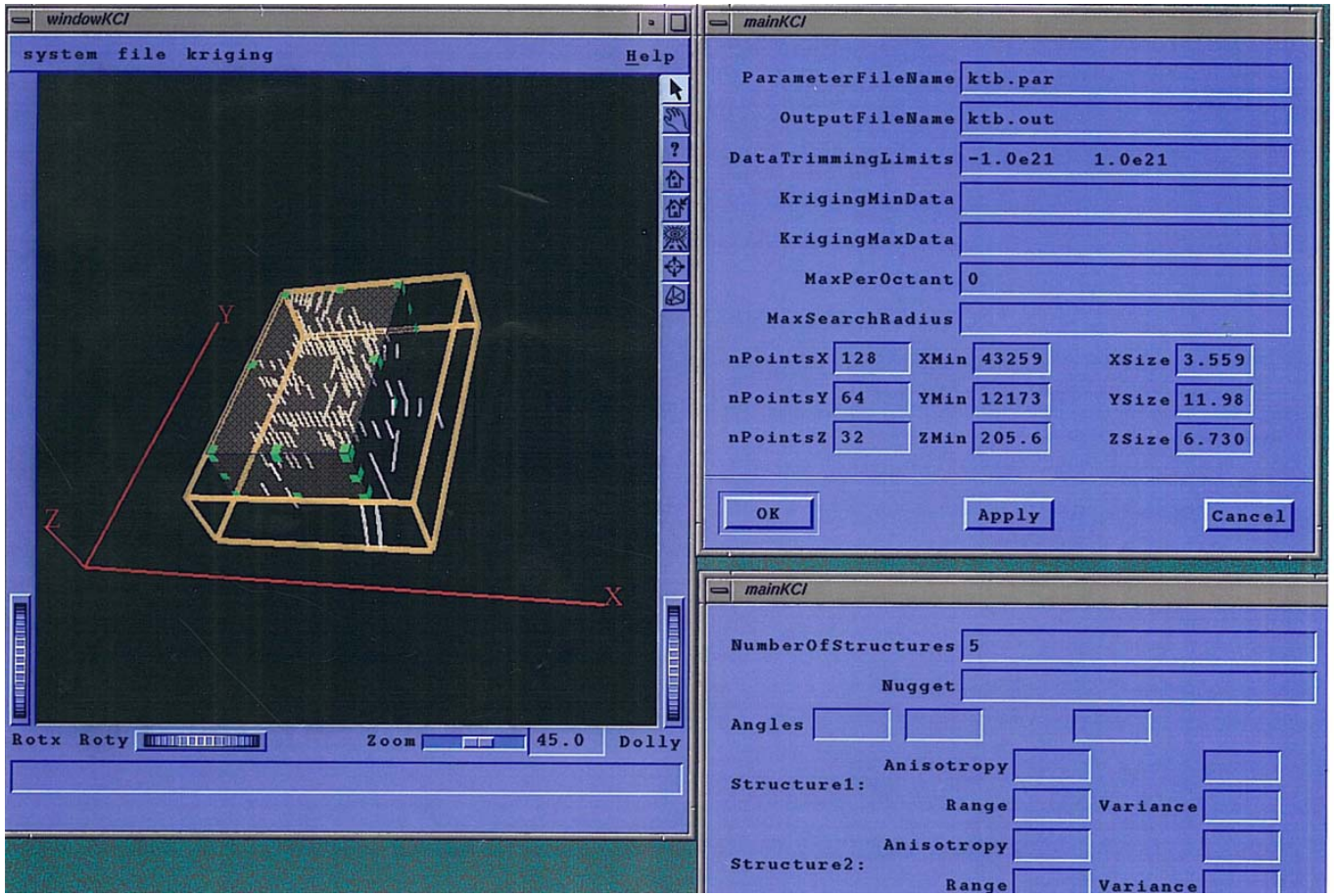


Presented at a project meeting

Geostatistics: Display of 2D data slice

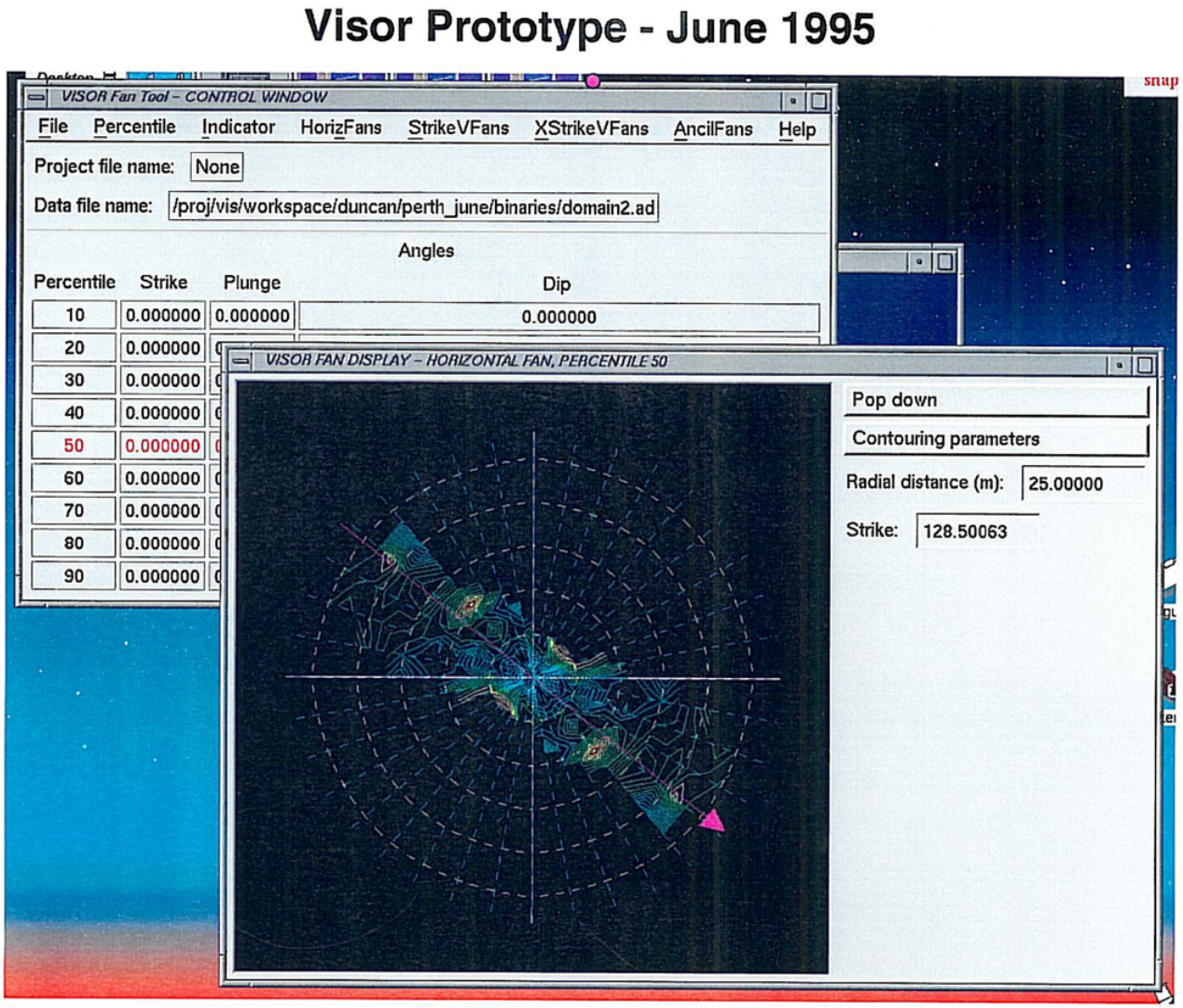
Shown during a visit to the client's offices in Perth

Geostatistics: Failed prototype

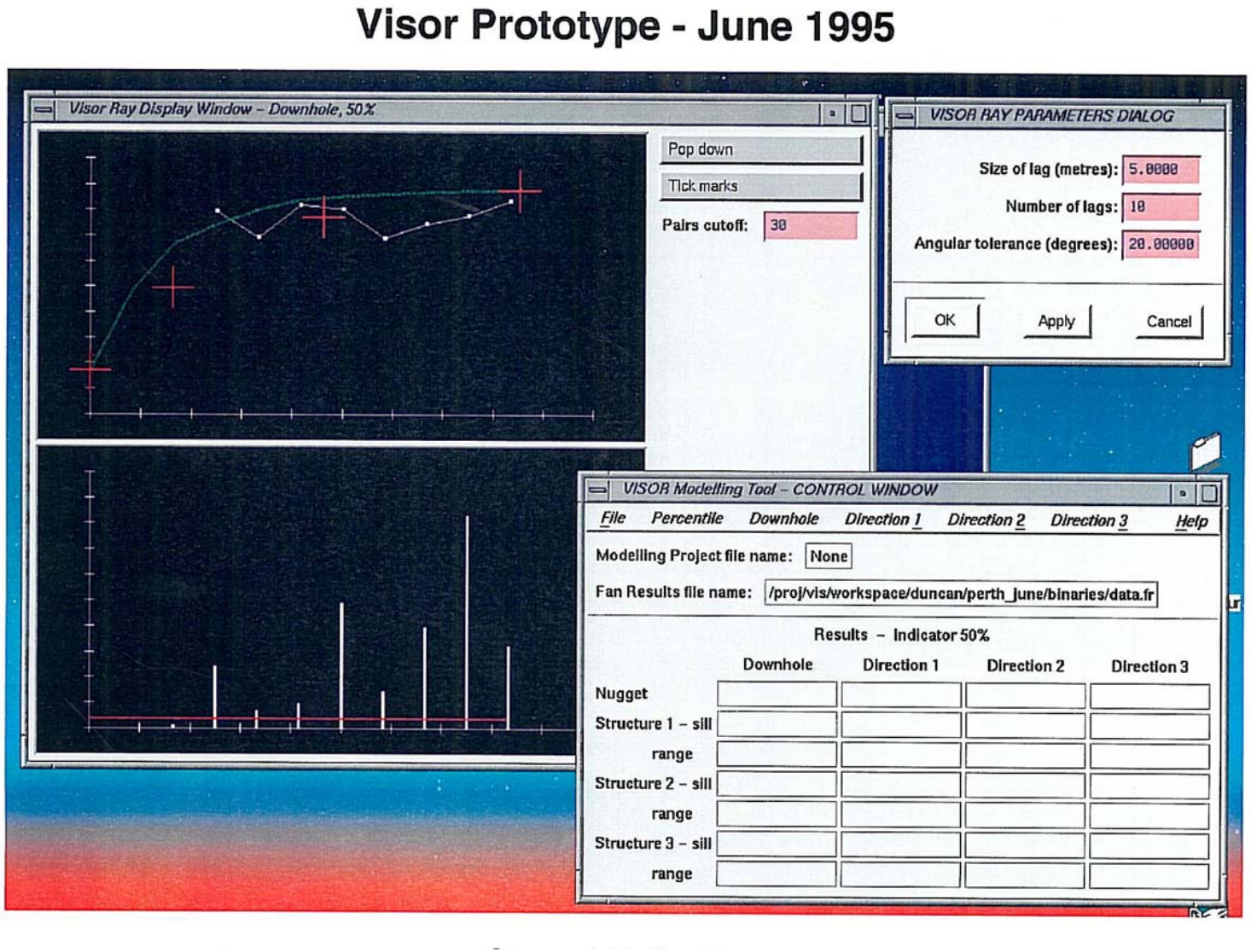


Shown during a visit to the client's offices in Perth

Geostatistics: First system demo (1)

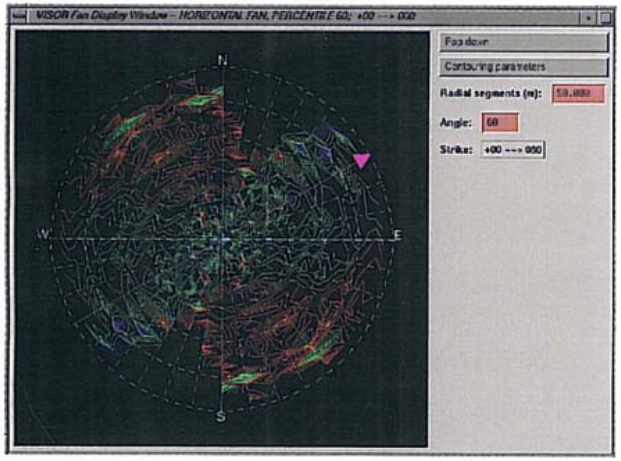


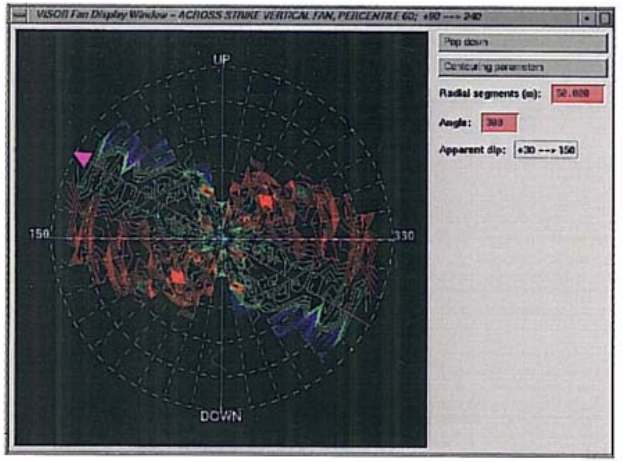
Geostatistics: First system demo (2)

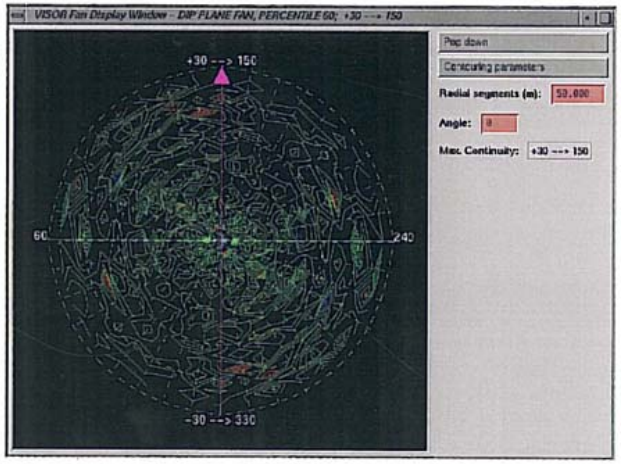


Geostatistics: Second system demo

Variogram Fan calculating and displaying tool







Three fans (horizontal, across-strike and dip-plane)

About a “first” prototype

The Vasa was a first prototype of a new concept for the Swedish navy. Launched in 1628, it sank on the day of its first voyage when a gust of wind caught its sails and tipped it sideways.

“The first prototype of almost every weapons system is a failure, and you then learn from that failure how to get the new idea to work” – ABC Radio National, Sunday 2nd August, 2015

Summary so far

- Use the double-diamond approach to help identify the real problem and to choose from a range of possible solutions.
- Use an iterative approach, both overall and inside each step
- Don’t expect your prototypes to be the final solutions, especially when you are looking for the real problem. They are only methods of communicating and evaluating an interactive concept.
- “Fail” is not a useful concept when iterating over design ideas or design solutions
- Involve the groups of users and other stakeholders at each stage

Discussion task

Small groups:

Melbourne's public transport had trains, trams and buses. Each had its own culture of travel, its own style of ticketing, its own set of passengers. Some passengers mixed their modes of travel.

Imagine you were asked to design a unified information and ticketing system for Melbourne's public transport. Discuss what the double-diamond design process might have looked like.

Pick one of the stages to talk about:

- Discover the real problems, define what needs to be done, develop some prototype solutions, deliver the final solution