# ­Data Analysis & Visualization for IT & Information Security Professionals

# Chapter 1: Introduction

## Purpose of This Book

## The Power of a Story

## Examples of Storytelling

### Capacity planning

### Creating an incident narrative

### Effectively assessing and communicating risk

## Tools of the Trade

### The most valuable tool

### The rest of the toolbox

# Part 1: Finding the Story Chapter 2: Positioning Analytics in IT & Information Security

## Strengths & limitations of human intuition

### Intuition vs data analysis

### Patterns & randomness

## Strengths & limitations of statistics

### Applying probability to an uncertain world

### Lying with data

## Instilling a culture of analytics

### Planning for analytics

### Diagnosing & treating analutophobia

## The role of visualization in data analysis

# Chapter 3: Conducting Data Analysis

## Defining the goal

### Beginning with a question

### Has the question been answered already?

## Data sourcing & handling

### Cataloging your data sources

### Evaluating the efficacy of your data sources

## Uncovering the story

### The importance of iterative exploration

## Communicating Your Work

### Realizing that you are the audience

### Realizing that you are not the audience

# Chapter 4: Working With Data

## Acquiring Data

### The brewpub problem (sampling & inference)

## Data Wrangling

### Cleansing data

### Normalizing data

### Storing data for processing and archival

### Avoiding common mistakes

# Chapter 5: Harnessing the Power of “Little Data”

## Descriptive statistics

### Understanding continuous vs categorical variables

### Performing common operations on continuous data

## Performing common operations on categorical data

### Correlation, probability and margin of error

### Communicating uncertainty vs variability

## Example: Estimating system uptime

### Communicating complexity

## Analyzing at Scale

# Part 2: Visual Storytelling Chapter 4: The Craft of Communication

## The Elements of Communication

### Senders / Channels / Recipients

## Characteristics of Successful Communication

### Context / Clarity / Integrity / Style

## Common Pitfalls in Communication

### The curse of knowledge

### One story fits all

# Chapter 5: Communicating Visually

## Visual Communication is Not a Natural Skill

## Cognitive Science: Decoding the Decoding Process

### Signal Detection & Magnitude Estimation

### Weber’s Law / Steven’s Power Law

### Comparing & Ranking Elementary Perceptual Tasks:

### Cleveland & McGill / Mackinlay

### Encoding Multiple Attributes

### Shape & Lightness / Size & Value /

### Orientation & Size / Shape & Size /

### Length & Length / Angle & Angle

### Understanding Gestalt

### Visual Processing

### Pre-attentive vs Attentive / Eye Tracking / Using Color Well

# Chapter 6: Producing Pragmatic Visualizations

## Creating and Working with Foundational Visualizations

### Bar charts

### Line charts

### Pie charts

### Scatterplots

### Histograms

### Density plots

### Box/violin plots

# Chapter 7: Visualizing Complexity

## Recognizing Complexity in IT & Information Security

### Data volume

### Data diversity

### Interconnectedness

## Visualizing Networks

### Radial graphs

### Force directed graphs

### Chord diagrams

### Hive plots

## Exploring Multivariate Data

### Trellis plots

### Scatterplot matrices

### Small multiples

### Parallel coordinate plots

# Chapter 8: Animation & Interaction

## Using Motion to Tell a Story

### Knowing when to use animation as a medium

### Understanding presentation vs exploration

## Basic Animation Techniques

### Creating flipbook-style visualizations

### Adding smooth animations to foundational visualizations

## Giving the Audience Control

### Framing exploration

### Data-driven exploration and interaction

# Chapter 9: Designing for Monitoring

## The Evolution & Elevation of the Dashboard in IT & Security

## Dashboard Data Selection

### What Are You Monitoring For?

### Determining if the Data You Have is the Data You Need

## Creating Effective Dashboards

### Focusing on Speed of Inference

### Highlighting Critical Differences

### Applying Visualization Fundamentals to Your Design

### Knowing When To Use Words & Numbers vs Pictures

## Presenting Dashboards

### Producing the Printed Dashboard

### Designing Dashboards for the Big Screen

### Avoiding “Gotchas” in Mobile Dashboards

### Knowing When to Add Interaction

# Conclusion Chapter 10: Playing the Role of Storyteller

## Training for Your Role

### Creating a cycle of continuous improvement

### Breaking free of constraints

## Avoiding the Pinocchio Syndrome

## Setting Up a Feedback Loop

# Chapter 11: Resources

## Communication Resources

## Data Analysis Resources

## Visualization Resources