DLI Accelerated Data Science Teaching Kit

Lecture 8.3 - Crown Jewel, Self-contained Figures and More Tips

Practitioners' Guide

Colors: start with black & white, then add **colors**, carefully

Forces you to focus on content and layout

Fonts: **sans-serif** generally easier to read

(on Mac, Helvetica is great start)

Animation: start with **no** animation, then add meaningful ones

Use Pictures and Videos

"Pictures" include tables, diagrams, charts, etc.

- Pictures often more succinct & memorable
- People like pictures and love movies

And show them ASAP!

Once people fall asleep, it's hard to wake them up!

If you have good stuff, show them now.

Example

SIGGRAPH2007
Computer Graphics Proceedings, Annual Conference Series, 2007

Scene Completion Using Millions of Photographs

James Hays Alexei A. Efros
Carnegie Mellon University

Original Image Input Scene Matches Output

Figure 1: Given an input image with a missing region, we use matching scenes from a large collection of photographs to complete the image.

Abstract

What can you do with a million images? In this paper we present a new image completion algorithm powered by a huge database of photographs gathered from the Web. The algorithm patches up holes in images by finding similar image regions in the database that are not only seamless but also semantically valid. Our chief insight is that while the space of images is effectively infinite, the space of semantically differentiable scenes is actually not that large. For many image completion tasks we are able to find similar scenes which contain image fragments that will convincingly complete the image. Our algorithm is entirely data-driven, requiring no annotations or labelling by the user. Unlike existing image completion methods, our algorithm can generate a diverse set of results for each input image and we allow users to select among them. We demon-

There are two fundamentally different strategies for image completion. The first aims to reconstruct, as accurately as possible, the data that *should have been* there, but somehow got occluded or corrupted. Methods attempting an accurate reconstruction have to use some other source of data in addition to the input image, such as video (using various background stabilization techniques, e.g. [Irani et al. 1995]) or multiple photographs of the same physical scene [Agarwala et al. 2004; Snavely et al. 2006].

The alternative is to try finding a plausible way to fill in the missing pixels, hallucinating data that *could have been* there. This is a much less easily quantifiable endeavor, relying instead on the studies of human visual perception. The most successful existing methods [Criminisi et al. 2003; Drori et al. 2003; Wexler et al. 2004; Wilczkowiak et al. 2005; Komodakis 2006] operate by extending

Practitioners' Guide:
Tips for Researchers

Crown-jewel pictures are important

- Overview of what readers is going to get — **cut to the chase**
- People skim and look at "interesting" things first
- Reviewers are busy and sleepy 😴 (read 5-10 papers per conference) — it's refreshing to read an interesting paper

How to do it?

- Use your **most impressive** figure
- Can be similar to another shown later

Figures should be self-contained

Why?

- Don’t make people go back and forth between text & figure
- Bad figures means **bad first impression** (reject!)

How to fix?

- Succinctly describe your main (take-away) messages

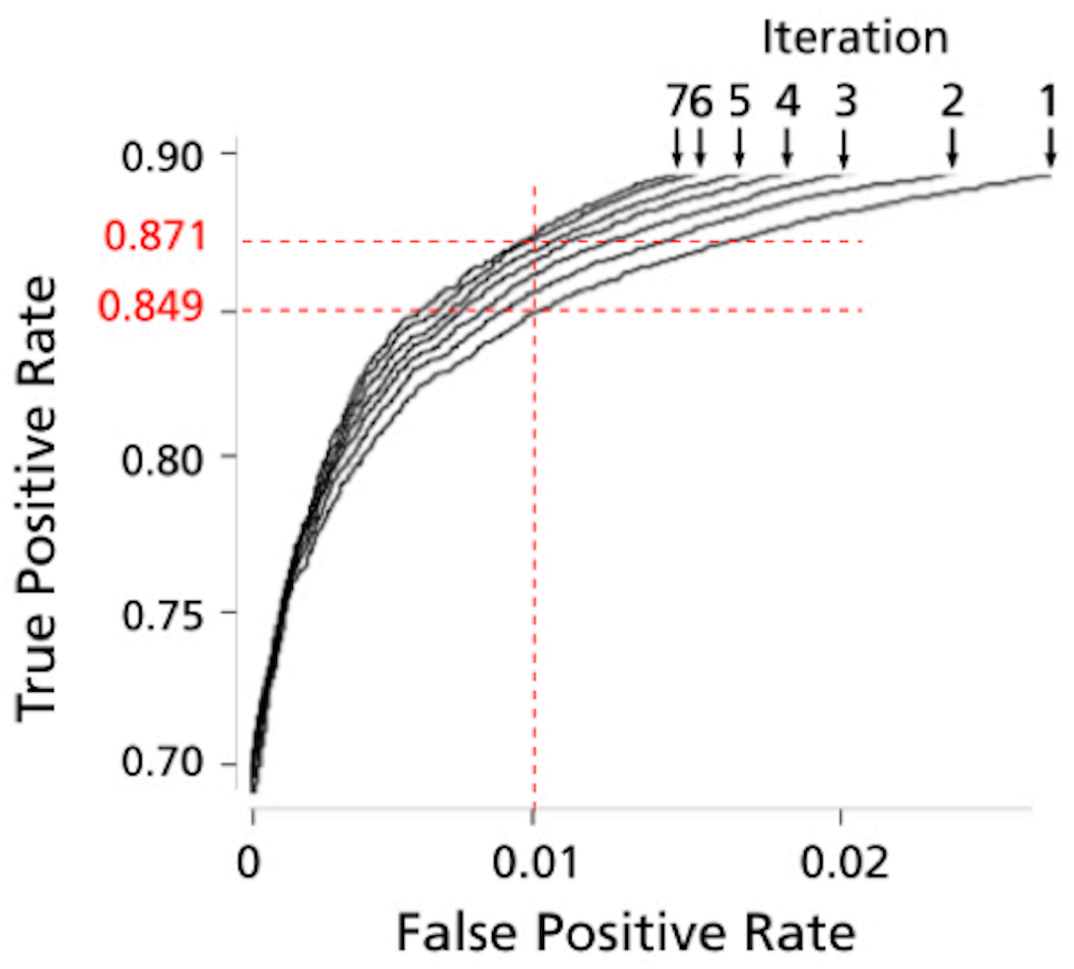


Figure 8: ROC curves of 7 iterations; true positive rate incrementally improves.

Example

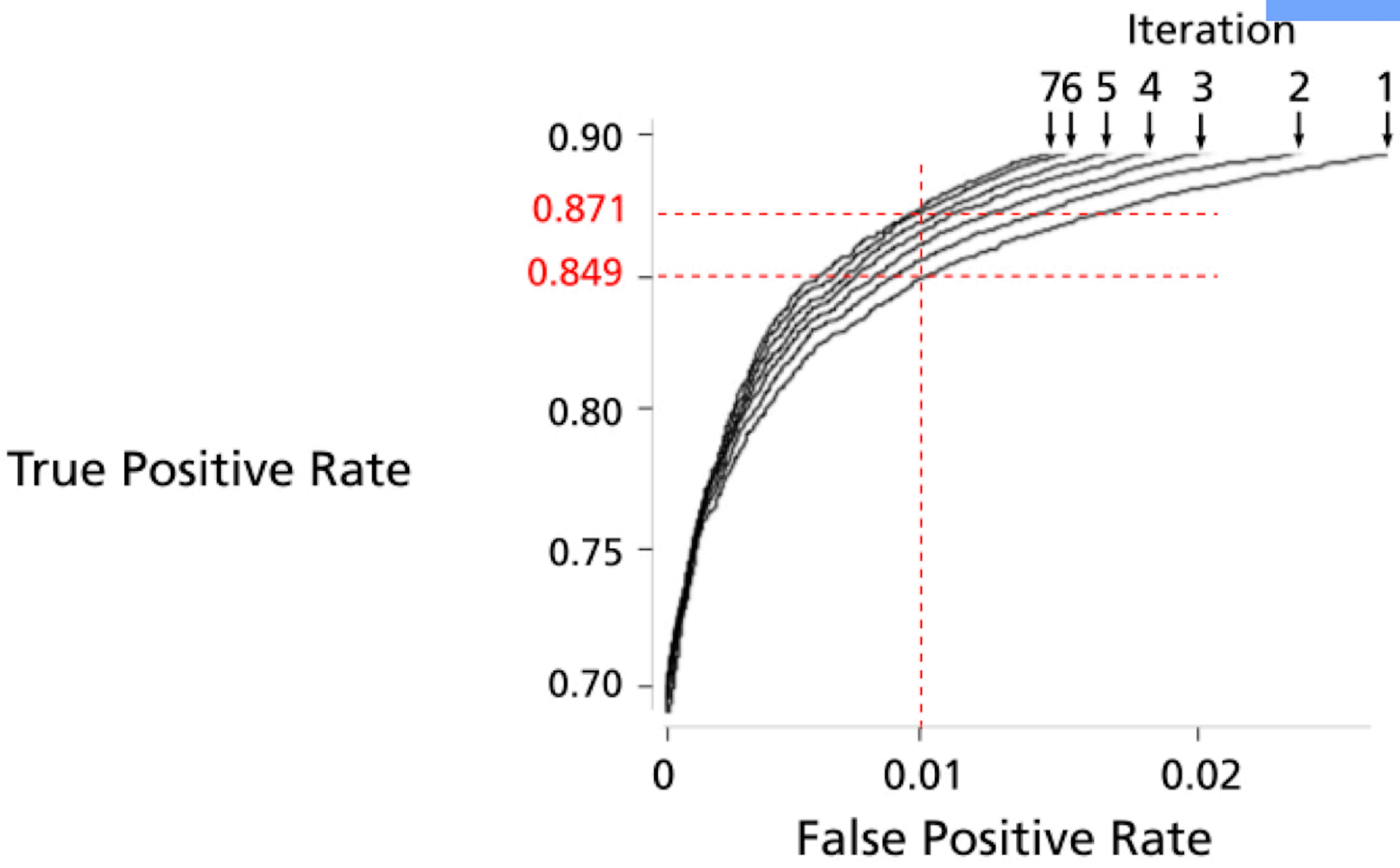


Figure 8: ROC curves of 7 iterations; true positive rate incrementally improves.

http://www.cs.cmu.edu/~dchau/polonium_sdm2011.pdf

Example

Apolo: Making Sense of Large Network Data by Combining Rich User Interaction and Machine Learning

Duen Horng "Polo" Chau, Aniket Kittur, Jason I. Hong, Christos Faloutsos
School of Computer Science
Carnegie Mellon University
Pittsburgh, PA 15213, USA
{dchau, nkittur, jasonh, christos}@cs.cmu.edu

ABSTRACT
Extracting useful knowledge from large network datasets has become a fundamental challenge in many domains, from scientific literature to social networks and the web. We introduce Apolo, a system that uses a mixed-initiative approach—combining visualization, rich user interaction and machine learning—to guide the user to incrementally and interactively explore large network data and make sense of it. Apolo engages the user in bottom-up sensemaking to gradually build up an understanding over time by starting small, rather than starting big and drilling down. Apolo also helps users find relevant information by specifying exemplars, and then using a machine learning method called Belief Propagation to infer which other nodes may be of interest. We evaluated Apolo with twelve participants in a between-subjects study, with the task being to find relevant new papers to update an existing survey paper. Using expert judges, participants using Apolo found significantly more relevant papers. Subjective feedback of Apolo was also very positive.

Author Keywords
Sensemaking, large network, Belief Propagation

ACM Classification Keywords
H.3.3 Information Storage and Retrieval: Relevance feedback; H.5.2 Information Interfaces and Presentation: User Interfaces

General Terms
Algorithms, Design, Human Factors

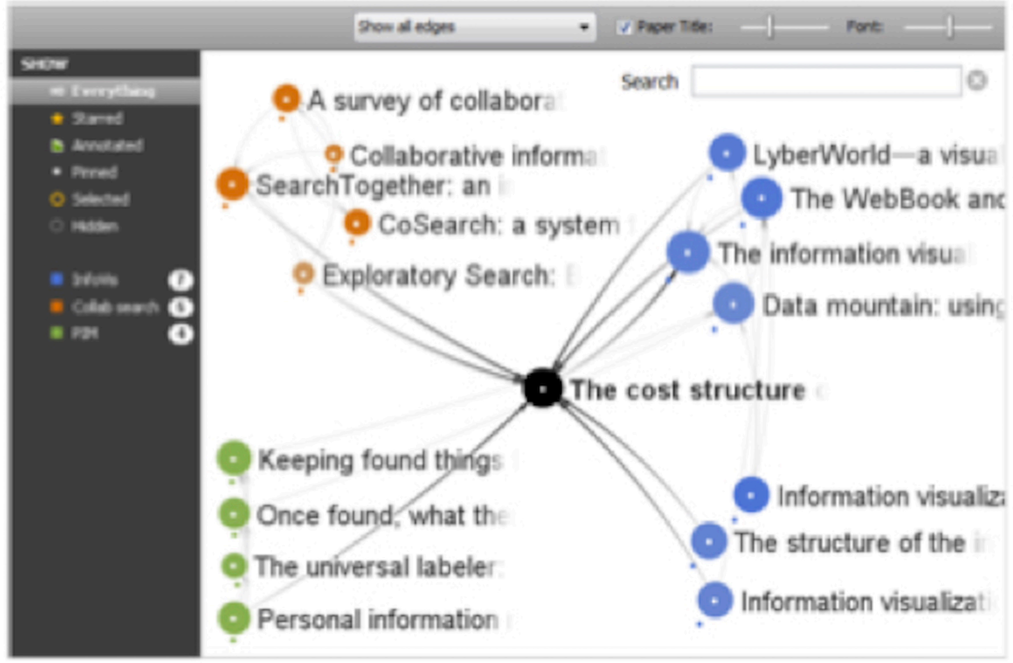


Figure 1. Apolo displaying citation network data around the article *The Cost Structure of Sensemaking*. The user gradually builds up a mental model of the research areas around the article by manually inspecting some neighboring articles in the visualization and specifying them as exemplar articles (with colored dots underneath) for some ad hoc groups, and instructs Apolo to find more articles relevant to them.

representation or schema of an information space that is useful for achieving the user's goal [31]. For example, a scientist interested in connecting her work to a new domain must build up a mental representation of the existing literature in the new domain to understand and contribute to it.

For the above scientist, she may forage to find papers that she thinks are relevant, and build up a representation of how

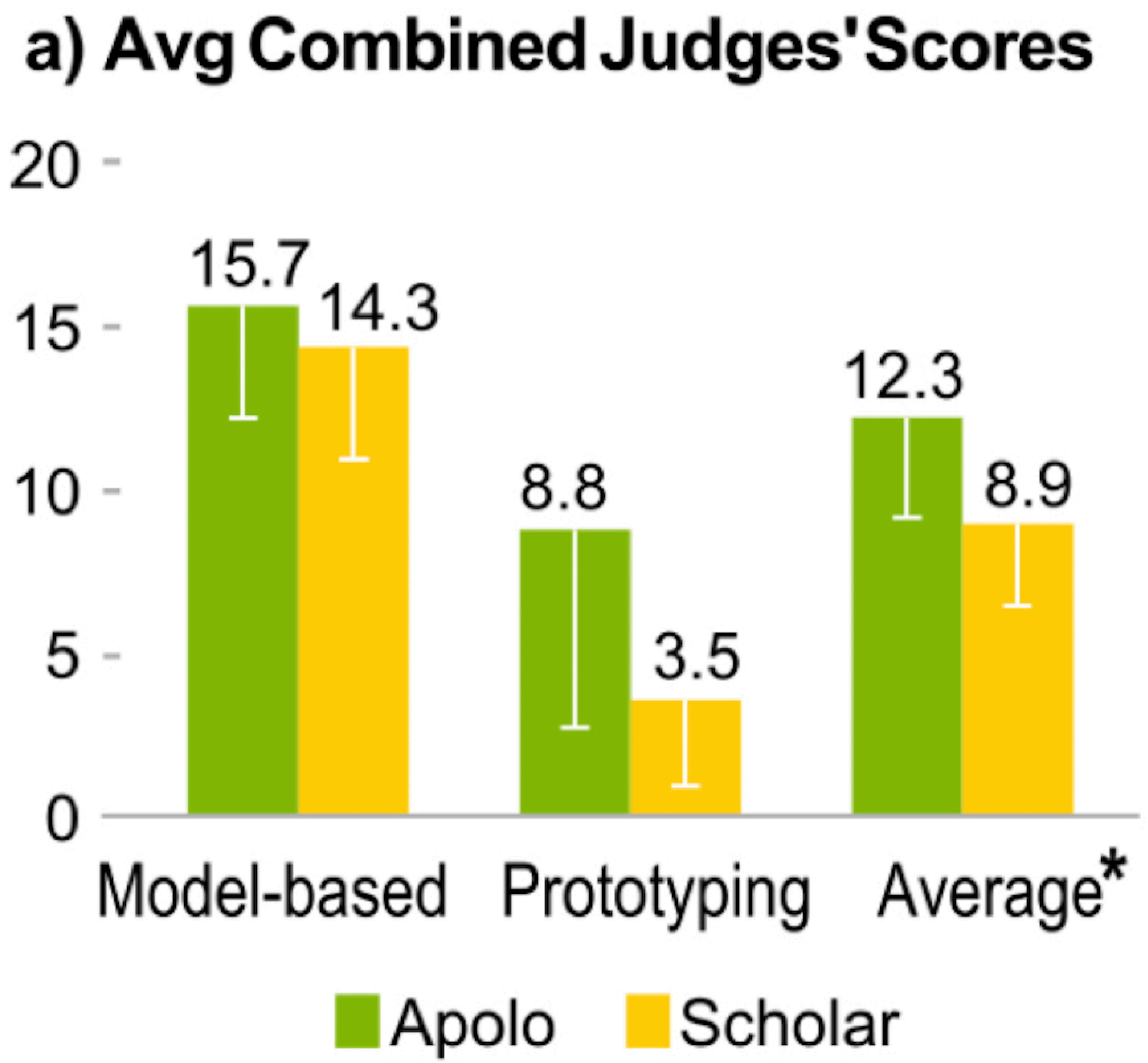
Use legible fonts.

If people can’t see it, they won’t appreciate it.

For printed materials, print them out and check!

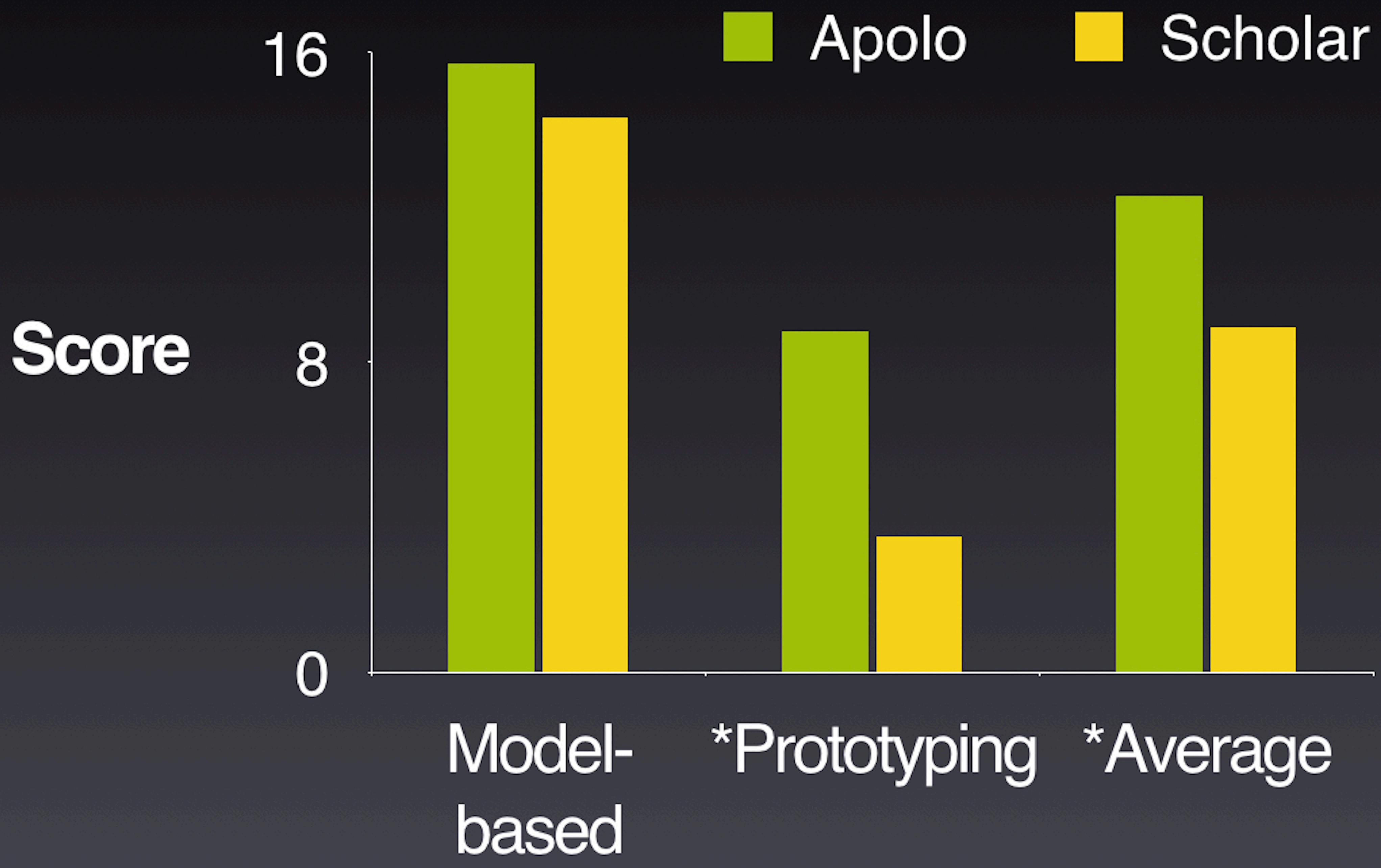
Rule of thumb: about 7 lines of text on a slide.

Example


a) Avg Combined Judges' Scores
20
15
10
5
0
15.7
14.3
8.8
3.5
12.3
8.9
Model-based
Prototyping
Average*
Apolo
Scholar

Example

Judges' Scores



Higher is better.
Apolo wins.

** Statistically significant, by two-tailed t test, $p < 0.05$*

Great Work destroyed by **Poor Presentation**

Bad color schemes

Bad, tiny fonts

Too much animation

Too much data

can you read this?

100 times faster!

Don Mcmillan: Life After Death by PowerPoint

http://www.youtube.com/watch?v=lpvgfmEU2Ck&feature=player_embedded

DLI Accelerated Data Science Teaching Kit

Thank You