

LECTURE 16: Writing InfoVis Papers

Information Visualization
CPSC 533C, Fall 2007

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Overview

- Initial Stage: Paper Types
- Middle Pitfalls: Visual Encoding
- Late Pitfalls: Paper Strategy, Tactics, Results
- Final Pitfalls: Style and Submission
- Generally

InfoVis Validation Approaches

- algorithm complexity analysis
- implementation performance (speed, memory)
- quantitative metrics
- qualitative discussion of result pictures
- user anecdotes (insights found)
- user community size (adoption)
- informal usability study
- laboratory user study
- field study with target user population
- design justification from task analysis
- visual encoding justification from theoretical principles

Paper Types: Technique

- paper types as guide through validation choices
- technique/algorithm
 - most common: here's new algorithm to do X
 - do first, or do better
- validation
 - complexity, performance
 - quant metrics, qual discussion of pix

Paper Types: Design Study

- design study
 - justify visual encoding choices
 - what is mapping from domain problem to visual encoding
 - why does it solve problem
 - abstraction and justification is critical
 - not just apply technique X to domain Y
 - formative evaluation: ethnographic analysis, iterative design
- validation
 - anecdotes, adoption
 - design justification from task analysis
 - visual encoding justification from theoretical principles
 - secondary: user studies

Paper Types

- systems
 - design study for library/toolkit architectural choices
 - not for application-level visual encoding
 - lessons learned: why does anybody else care?
 - summative evaluation / user studies
 - lab studies of abstracted tasks
 - field studies with target users
- model
 - taxonomies: aid to thinking, finding gaps
 - formalism: new models/definitions (ex: space-scale)
 - commentary: advocate (ex: fisheye followup)

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 - don't just pick random technique-problem combinations
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- All That Coding Means I Deserve A Systems Paper
 - only if you have architectural lessons to share
- Neither Fish Nor Fowl
 - hard to straddle boundaries
 - pick one primary contrib, vs. others as secondary

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- 2D Good, 3D Better
 - must justify when benefits 3D outweigh cost of occlusion
 - abstract visual encoding allows choices over mapping variables to spatial position

Middle Stage: Visual Encoding 2

- Color Cacophony
 - blatant disregard for basic color perception facts
 - huge areas of highly saturated color
 - color coding intended for regions too small for distinguishability
 - nominal color coding for too many (15+) categories
 - red/green with no luminance difference
 - encode 3 separate variables with RGB

<p>Middle Stage: Visual Encoding 2</p> <ul style="list-style-type: none"> Color Cacophony <ul style="list-style-type: none"> blatant disregard for basic color perception facts huge areas of highly saturated color color coding intended for regions too small for distinguishability nominal color coding for too many (15+) categories red/green with no luminance difference encode 3 separate variables with RGB Rainbows Just Like In The Sky <ul style="list-style-type: none"> unjustified use of continuous rainbow colormap hue does not have implicit perceptual ordering standard rainbow colormap is perceptually nonlinear for many nameable regions, quantize into segmented colormap 	<p>Later Stage</p> <ul style="list-style-type: none"> after bulk of work done before begin writing draft strategy: paper-level structure tactics: section-level problems results: results section in specific 	<p>Later Pitfalls: Strategy</p> <ul style="list-style-type: none"> What I Did Over My Summer Vacation <ul style="list-style-type: none"> focus on effort not contribution too low-level Least Publishable Unit <ul style="list-style-type: none"> tiny increment beyond (your) previous work bonus points: new name for old technique Dense As Plutonium <ul style="list-style-type: none"> so much content that no room to explain why/how fails reproducibility test Bad Slice and Dice <ul style="list-style-type: none"> two papers split up wrong neither is standalone, yet both repeat 	<p>Later Pitfalls: Strategy</p> <ul style="list-style-type: none"> What I Did Over My Summer Vacation <ul style="list-style-type: none"> focus on effort not contribution too low-level Least Publishable Unit <ul style="list-style-type: none"> tiny increment beyond (your) previous work bonus points: new name for old technique Dense As Plutonium <ul style="list-style-type: none"> so much content that no room to explain why/how fails reproducibility test Bad Slice and Dice <ul style="list-style-type: none"> two papers split up wrong neither is standalone, yet both repeat
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 - detailed graphs for technique, High-level for design/wal
- Fear and Loathing of Complexity
 - present the complexity analysis for technique papers
 - full proof not required
- Straw Man Comparison
 - compare against state-of-the-art algorithms
 - head-to-head hardware best
- Tiny Toy Datasets
 - compare against state-of-the-art dataset sizes for technique
 - small datasets may be acceptable for user studies
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- Nonspecific Use Of Large
 - hundreds, 10K, 100K, millions, billions?

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- Resubmit Unchanged

Generality

- ▶ type: inbvis
- ▶ encoding: color is general vis, others more inbvis
- ▶ strategy: all research
- ▶ tactics: all research
- ▶ results: general vis
- ▶ style: all research, except
 - Story-Free Captions: general vis and graphics
 - My Picture Speaks For Itself: more inbvis