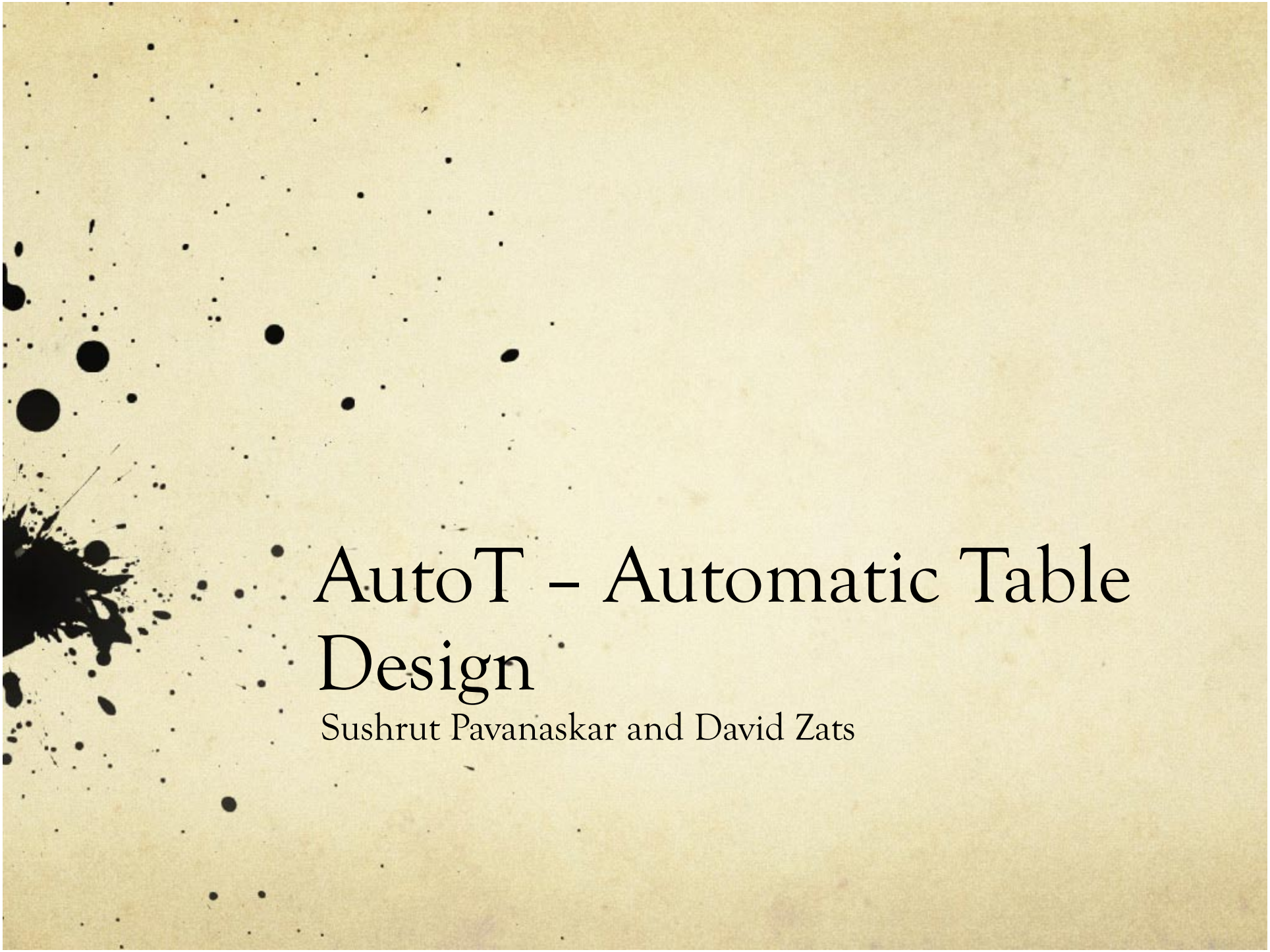


AutoT – Automatic Table Design

Sushrut Pavanaskar and David Zats

Motivation (I)

- Tables frequently used to inform
- However, good design practices not well-known
- Current applications do not solve this problem
  - LaTeX table design very limiting
  - Excel has poor defaults
  - Tableau does not provide sufficient suggestions based on desired message

Motivation (II)

originapt	destapt	distance	passengers	fare	carrier_lg	large_ms	fare_lg
ABI	ATL	889	11.73913	206.4274	AA	95.37037	200.7653
ABI	ORD	924	10.43478	245.2301	AA	96.875	246.0573
ABI	DFW	158	27.6087	112.9872	AA	100	112.9872
ABI	DEN	584	12.6087	198.2795	AA	96.55172	196.2809
ABI	IAH	323	15.54348	162.3722	AA	97.2028	160.1022
ABI	LAS	920	12.93478	225.9675	AA	95.79832	225.2437

- Problems with this table
  - Too much non-data ink (i.e. gridlines)
  - Difficult to differentiate headings from data
  - No meaningful message – just a collection of data

Problem Statement

- *Design an application that allows the user to quickly and easily create tables that convey the desired message*
  - Take as input raw table (i.e. csv)
  - Ask the user a few questions about desired message
  - Transform the table to convey message using good table design principles

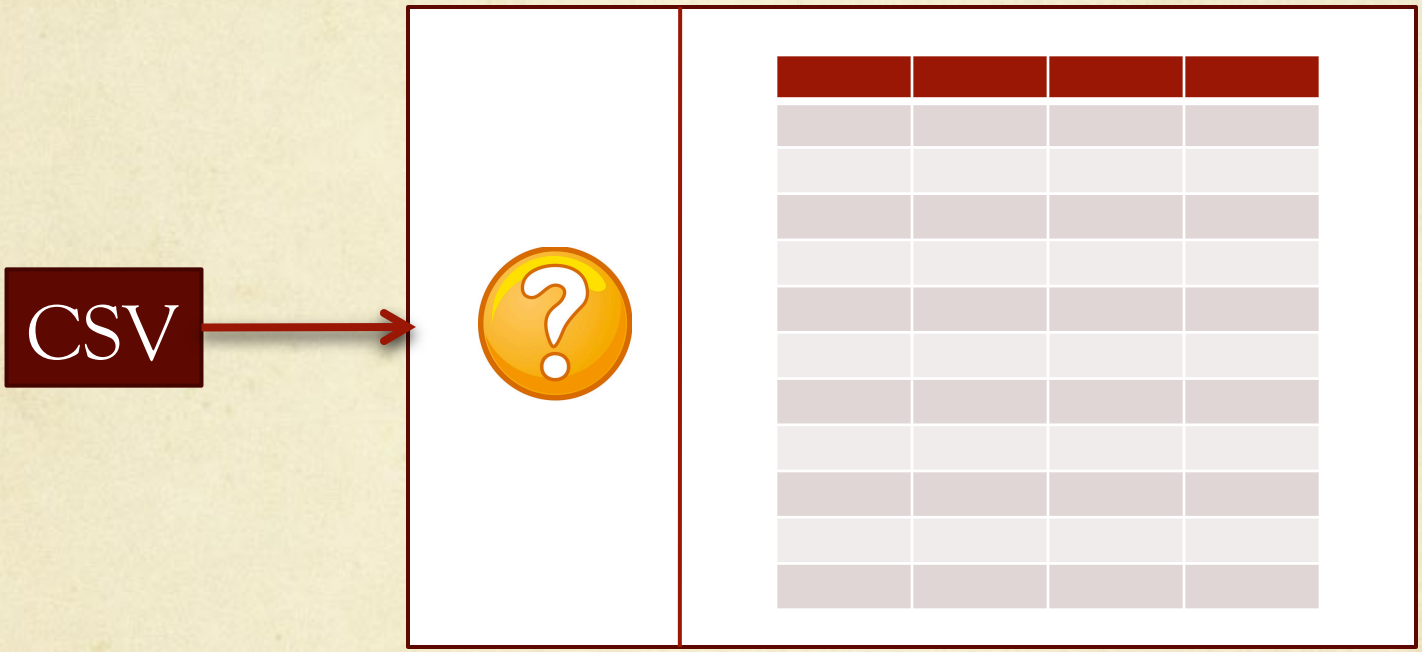
Approach (I)

- Research existing work to determine good principles
  - *Show Me the Numbers: Designing Tables and Graphs to Enlighten* – Stephen Few
  - *The Visual Display of Quantitative Information* – Edward R. Tufte
  - *Automated Table Processing: An (Opinionated) Survey* – Daniel Lopresti and George Nagy
- Determine the minimum set of questions necessary to extract user's intended message
  - What is the type of data?
  - Which portion of it is of greatest interest?
  - What is the focus (trends/abnormalities/extremes)?

Approach (II)

- Create an application based on the previously determined best practices and questions
  - Display raw data adhering to best practices
  - As responses to questions are obtained, modify table to convey desired message
  - Allow user to export finished table as image

User Interface



Challenge – Question Set

- Finding minimum number of questions is important research challenge
  - If too many – users will find burdensome
  - If too few – will present suboptimal table/message
- Approach
  - Survey scientific literature to determine most common uses of tables – derive first set of questions from this
  - Perform user studies to ensure set of questions is necessary *AND* sufficient

Milestones

- Research prior literature to determine best practices – (Sushrut & David)
- Design optimal set of questions (analysis of scientific literature and surveys) – (Sushrut)
- Develop and refine table-generating application – (David)

Thank You