



# 2020 LEAD Capstone Poster Session

**From Many, One**

*Simplifying rank list creation for the Residency Match  
using algorithmic aggregation of many interviewer opinions*

**Purushottam Nagarkar, MD**

**Assistant Professor**

**Plastic Surgery**



# Overview

- Final output of the residency interview is the rank list
- Rank list creation requires combining the opinions of many interviewers – tough to combine when different candidates had different interviewers!
- **I propose performing this task algorithmically**
- Algorithm has already been used for the last 5 years in Plastic Surgery residency interviews at UTSW
- Prototype web application has been created
- **More robust and secure application needs to be developed**



# Objectives

- Create a web-based application that allows programs to create rank list based on interviewer opinions
- Make the application available to residency and fellowship programs at UTSW and then around the country
- Goal is to improve the process of resident selection
- Real (but non-financial) benefits



# Background Information

- Residency programs often interview 8-10 applicants per position
- For programs with more than 1 or 2 positions per year, evaluating applicants and sorting them into a rank list can be very difficult
- Combining the opinions of multiple interviewers who did not interview the same candidates is not a trivial problem
- The rank list may appear to be created in a non-transparent manner
- Faculty interviewers feel their interviews were ultimately irrelevant
- The final list is likely to be sub-optimal (i.e. does not take into account all available data)



# Simple averaging of scores can have strange results

Interviewer A

Alan – 4/5  
Bob – 3.5/5

Interviewer B

Bob – 5/5  
Cindy – 5/5



Score averaging

Cindy (10/10)  
Bob (8.5/10)  
Alan (4/5)



# Relative rank algorithm produces more meaningful outcomes

Interviewer A
Alan (4/5)
Bob (3.5/5)

Interviewer B
Bob (5/5)
Cindy (5/5)

Relative rank algorithm



# Specific Aims

- Create a web-based application that allows programs to create rank list based on interviewer opinions
  - Secure access to insulate the program's data
  - Program interviewers can record their opinions through a GUI
  - Incorporation of objective metrics if desired (e.g. exam scores)
  - Generation of the consensus rank list when program notes that all available data has been provided
  - Ability to generate additional analysis of interviewer lists to identify trends and patterns



# Prototype web app in R Studio

## Submittals and Rankings

Show  entries

Search:

	...1	Alan	Bob	Cindy	Denise	Elian
1	Interviewer A	1	2		3	4
2	Interviewer B		1	2	5	4
3	Interviewer C	1	2		3	4
4	Interviewer D		1	2	5	4

Showing 1 to 4 of 4 entries

Notify

Rank

Show  entries

Search:

	Name
1	Alan
2	Bob
3	Cindy
4	Denise
5	Elian





# Proposed Budget

- Initial development
  - Estimate 80 hrs of work at \$125/hr = \$10,000
- Ongoing operation
  - Web hosting and domain name = \$500 / yr (low bandwidth and data requirements)
  - Site maintenance / technical support... ??



# Innovation and Significance

- The process of resident interviewing and rank list generation is very much ad hoc
- Risk of implicit bias is high – in general, we are likely not aware of our own biases
- There is great potential here to introduce a systematic algorithmic method
- Future directions would be to use anonymized data being recorded in these rank lists to generate “report cards” for each program to give them insight into their own behaviors and biases