

WHY COMPUTER SCIENCE RESEARCH IS BROKEN

Chad Spensky



WHY DO WE DO SCIENCE?

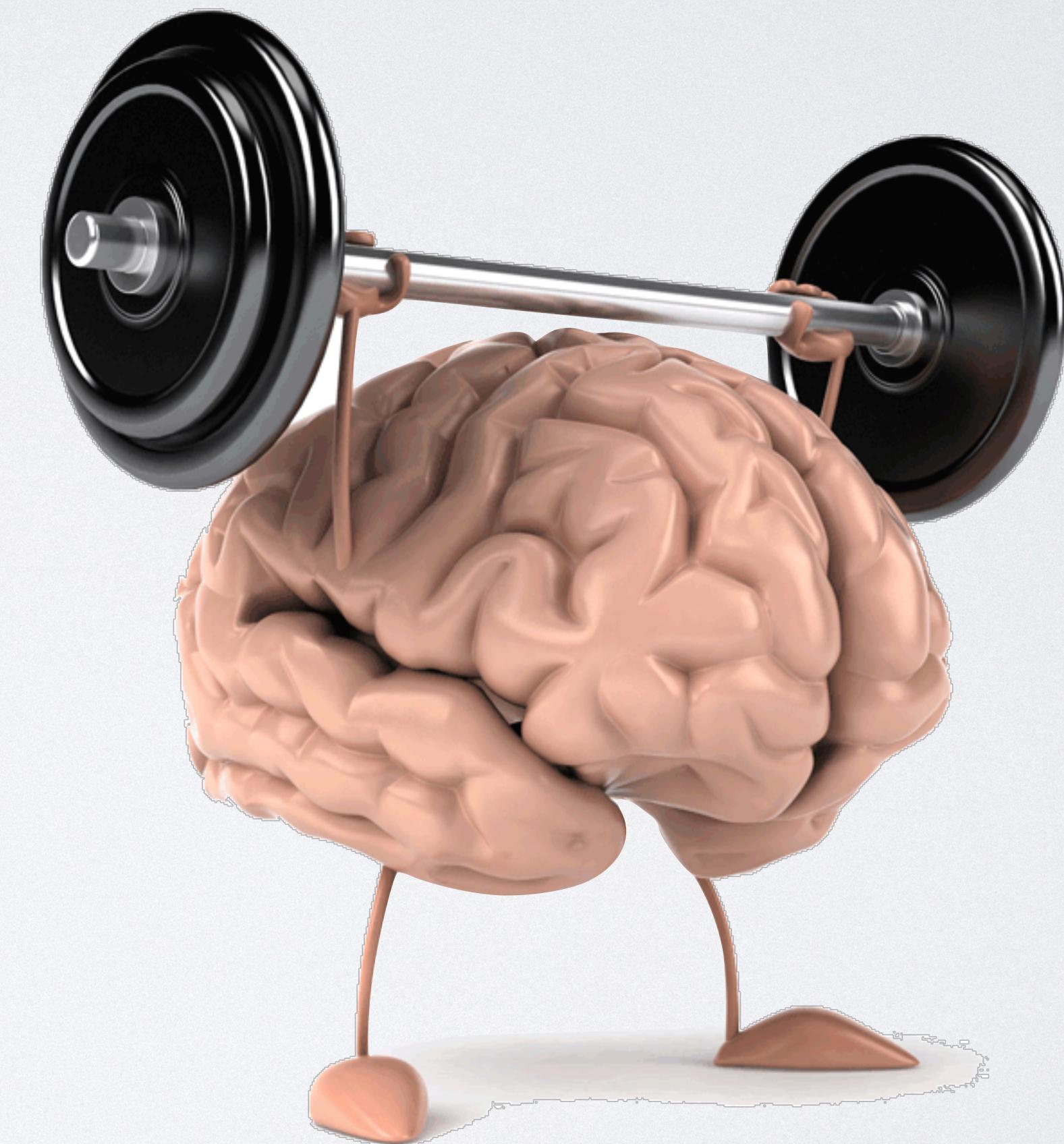
- For the money?





WHY DO WE DO SCIENCE?

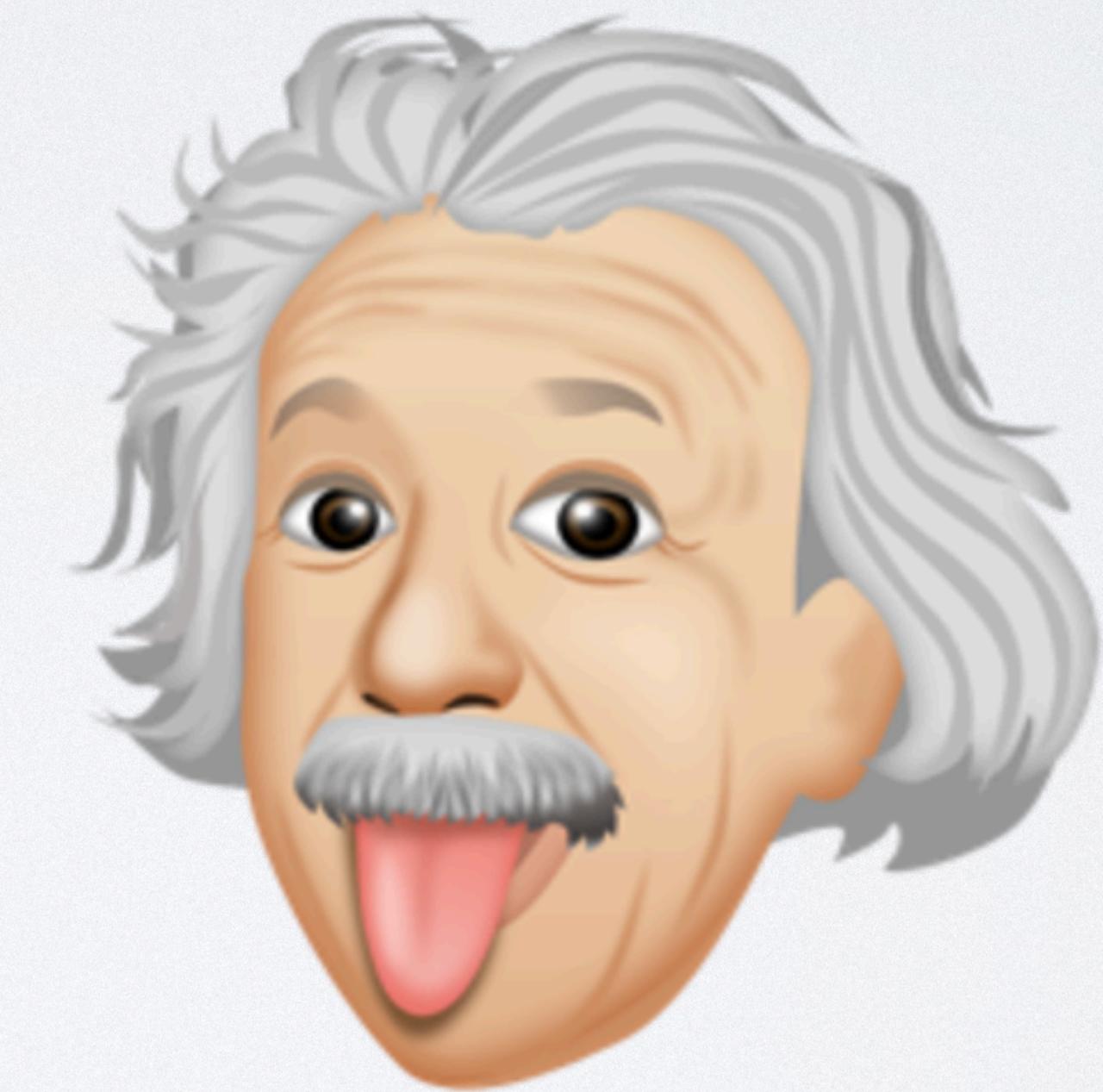
- To advance world knowledge?

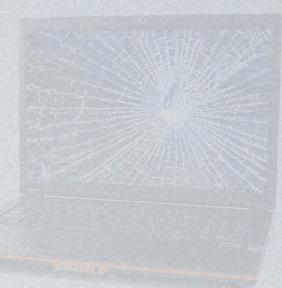




WHY DO WE DO SCIENCE?

- For the fame?

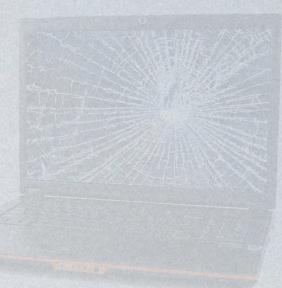




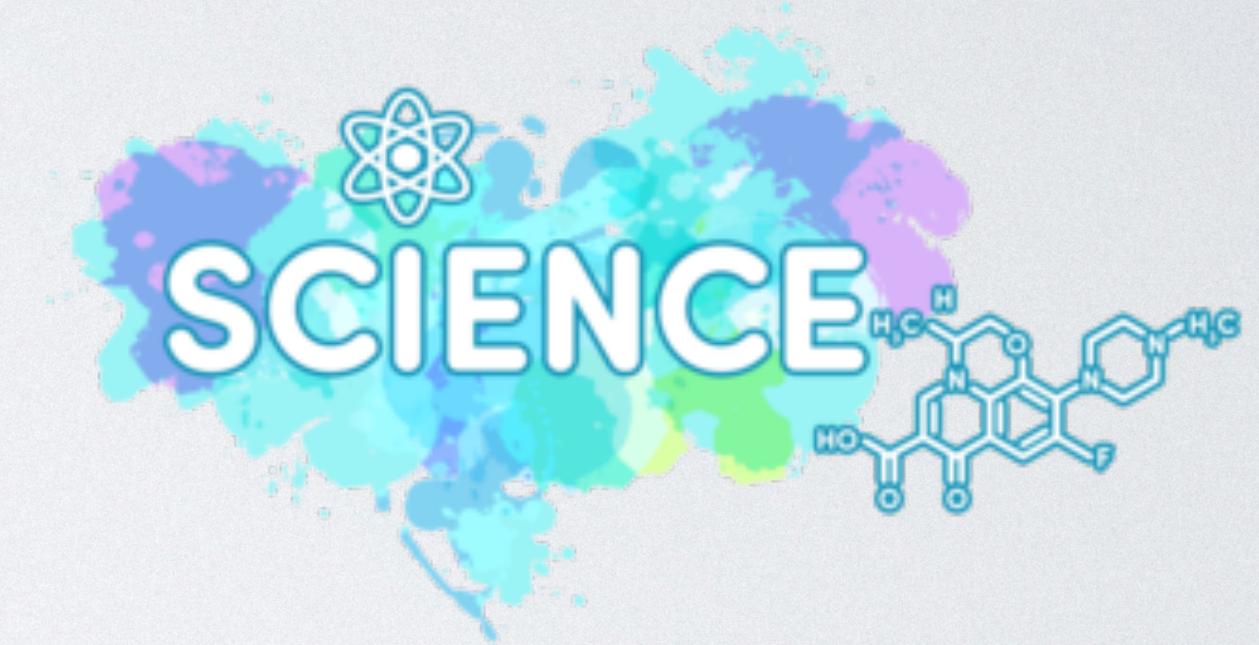
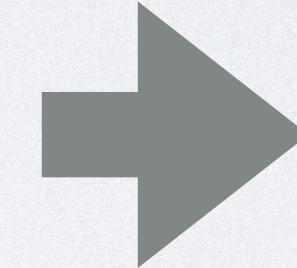
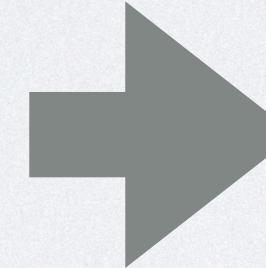
WHY DO WE DO SCIENCE?

- To make the world a better place?





RESEARCH AS A GAME

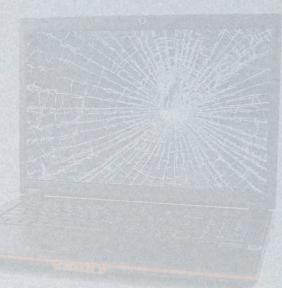




RESEARCH AS A GAME

- Goals
 - Publish a lot of papers
 - Publish first author papers
 - Publish in top conferences
 - Get cited
 - Do not fail





RESEARCH AS A GAME

- Winning Criteria
 - Publish > 3 papers
 - ~3 first authors in top tier
 - Good h-index on Google Scholar
 - Great job talk

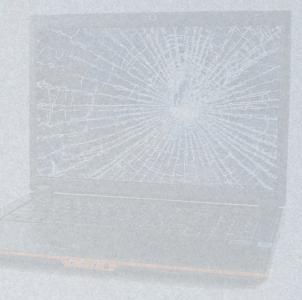
+ .winning+
is everything



MISALIGNED INCENTIVES

- If everyone acts in what they believe to be their own best interests, as opposed to the group's best interests, the overall result for the group may be suboptimal--and in some cases, catastrophic.

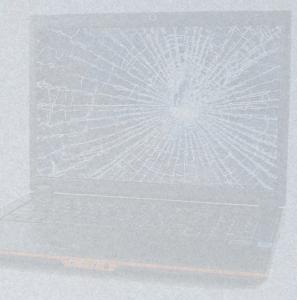




LET'S PLAY!

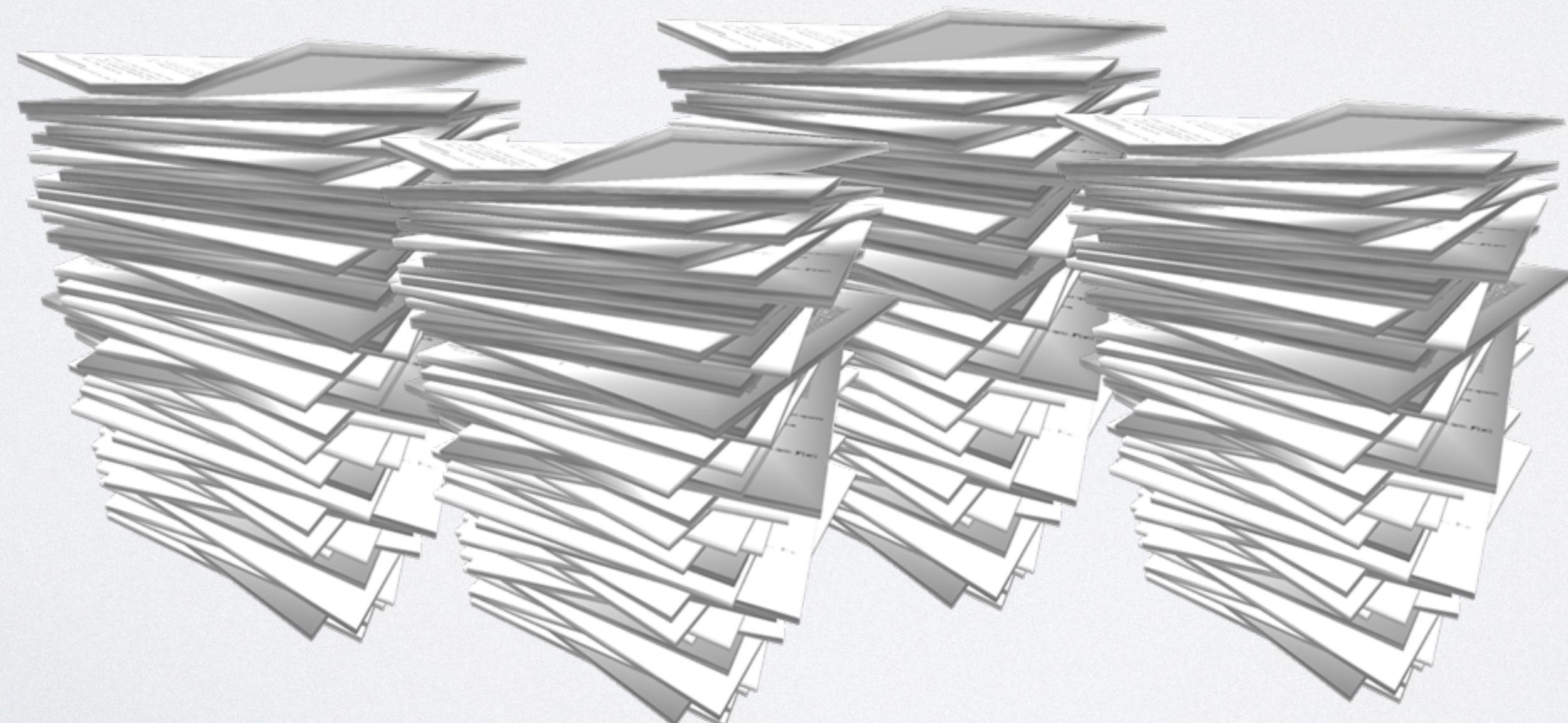
- We are all incentivized to maximize our individual well being
 - i.e., Get that professorship

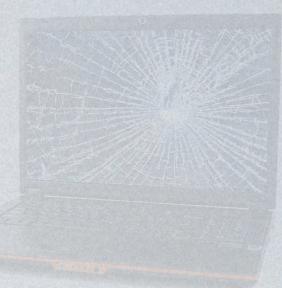




QUANTITY VS. QUALITY

- Disincentivizes “large” multi-year high-risk projects
- Result: More lower quality papers

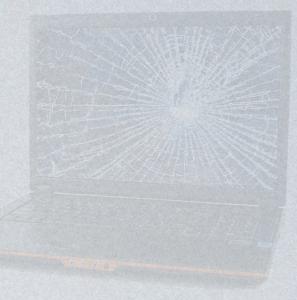




AUTHOR ORDER

- Disincentivizes working hard on non-first-author papers
- Result: most projects are a one-man show

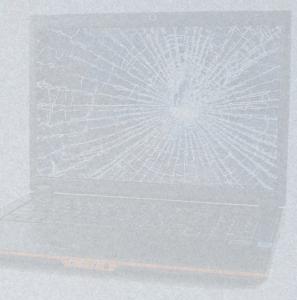




TOPTIER CONFERENCES

- Incentivizes high-quality, valued research

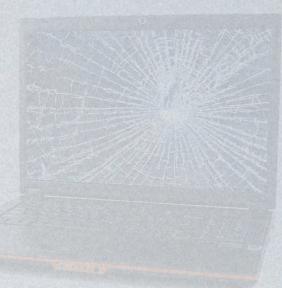




CITATION COUNT

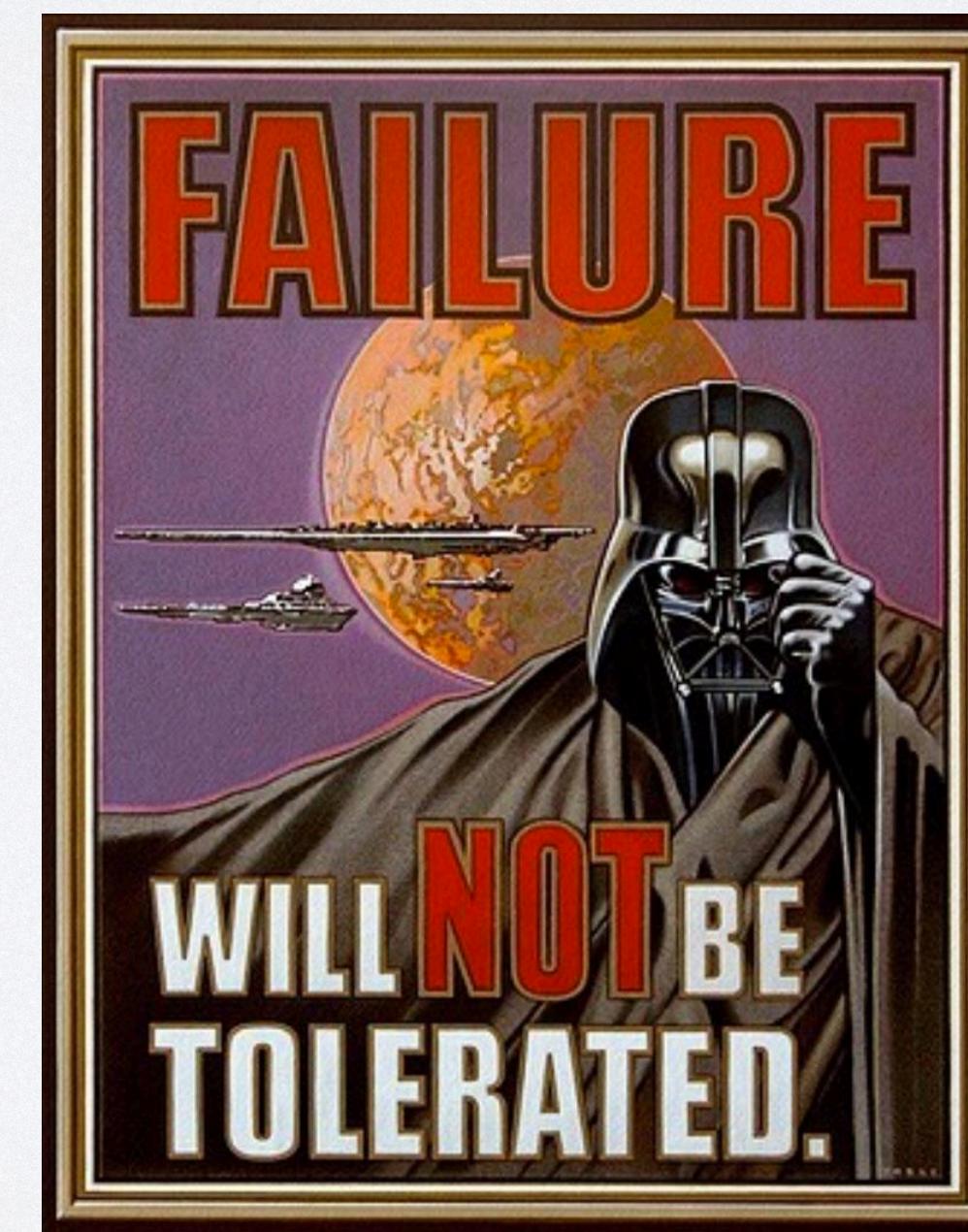
- Rewards high-value work

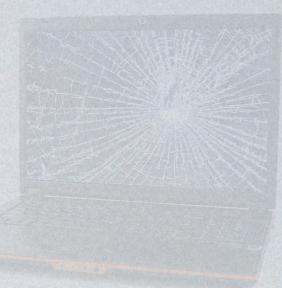




INABILITY TO FAIL

- Disincentivizes high-risk, potentially high-impact work
- Result: safe, marginal improvements





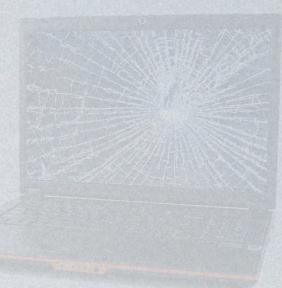
quickmeme.com



CONFERENCES: DOUBLE BLIND REVIEW

- No incentive to give a great review
- No accountability for a terrible review (e.g., “Not novel.”)
- Result: Low quality, mostly negative reviews

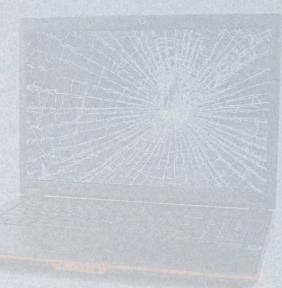




LACK OF REPRODUCIBILITY

- Incentivizes embellishing or overselling results
- Disincentivizes rigorous analysis of results (who's going check?)
- Result: potentially invalid findings and wasted time reproducing experiments

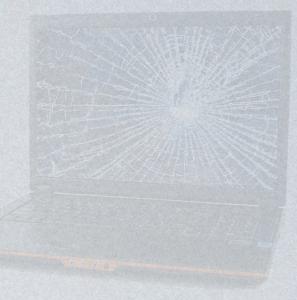




CAN WE DO BETTER?



DON'T
HATE THE
PLAYER
HATE THE
GAME



QUALITY OVER QUANTITY

- Why is 1 really good piece of research not enough in our field?



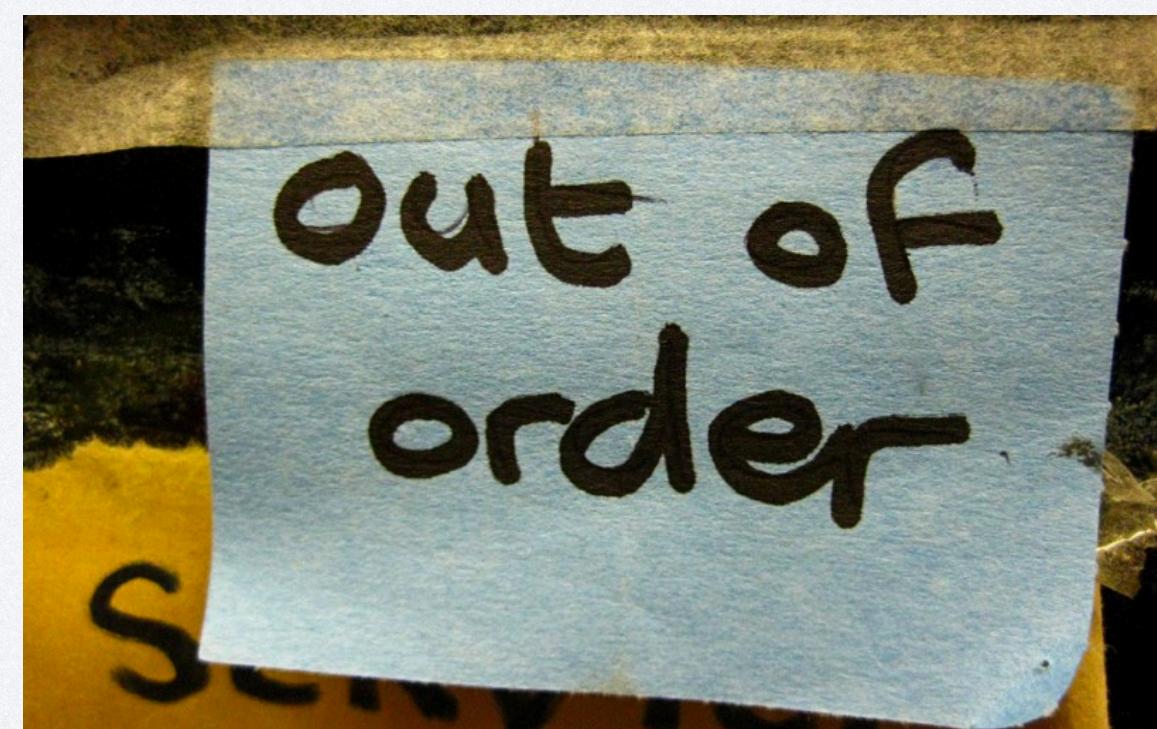
vs.





ALPHABETICAL ORDER!

- Incentivizes all authors to put in equal work
- Incentivizes collaborations (more papers)
- Ideal Result: More collaboration and larger projects

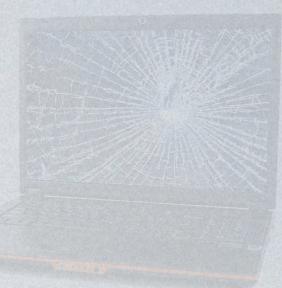




ONLY BLIND THE AUTHORS!

- Incentives good reviews
- Papers can cite reviewers by name
- Disincentivizes un-helpful reviews
- The authors will know who you are.

I can't wait,
to see you
again!



INABILITY TO FAIL

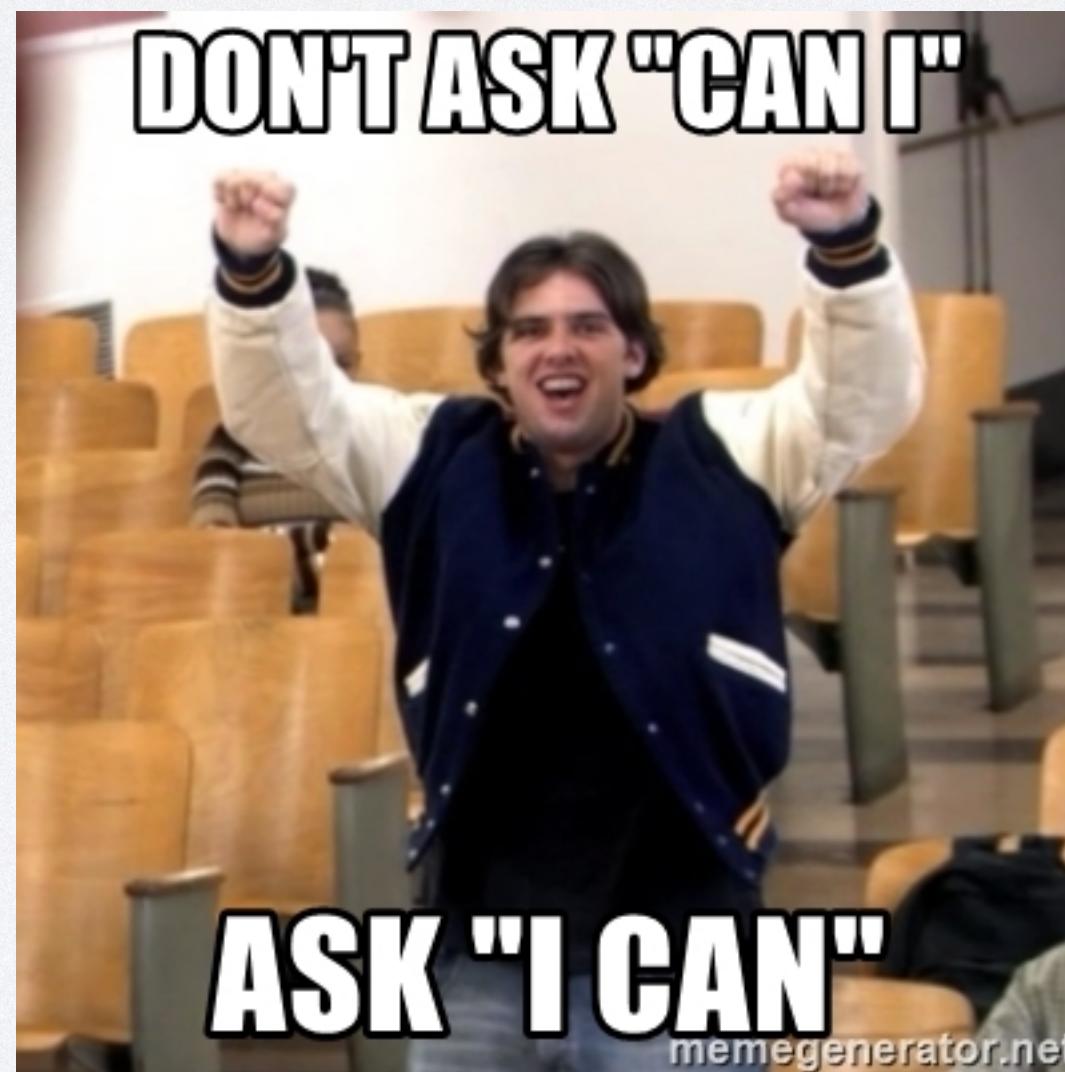
- We need to be more accepting of failures as a field...
- Honestly, I have no clue how to fix this...

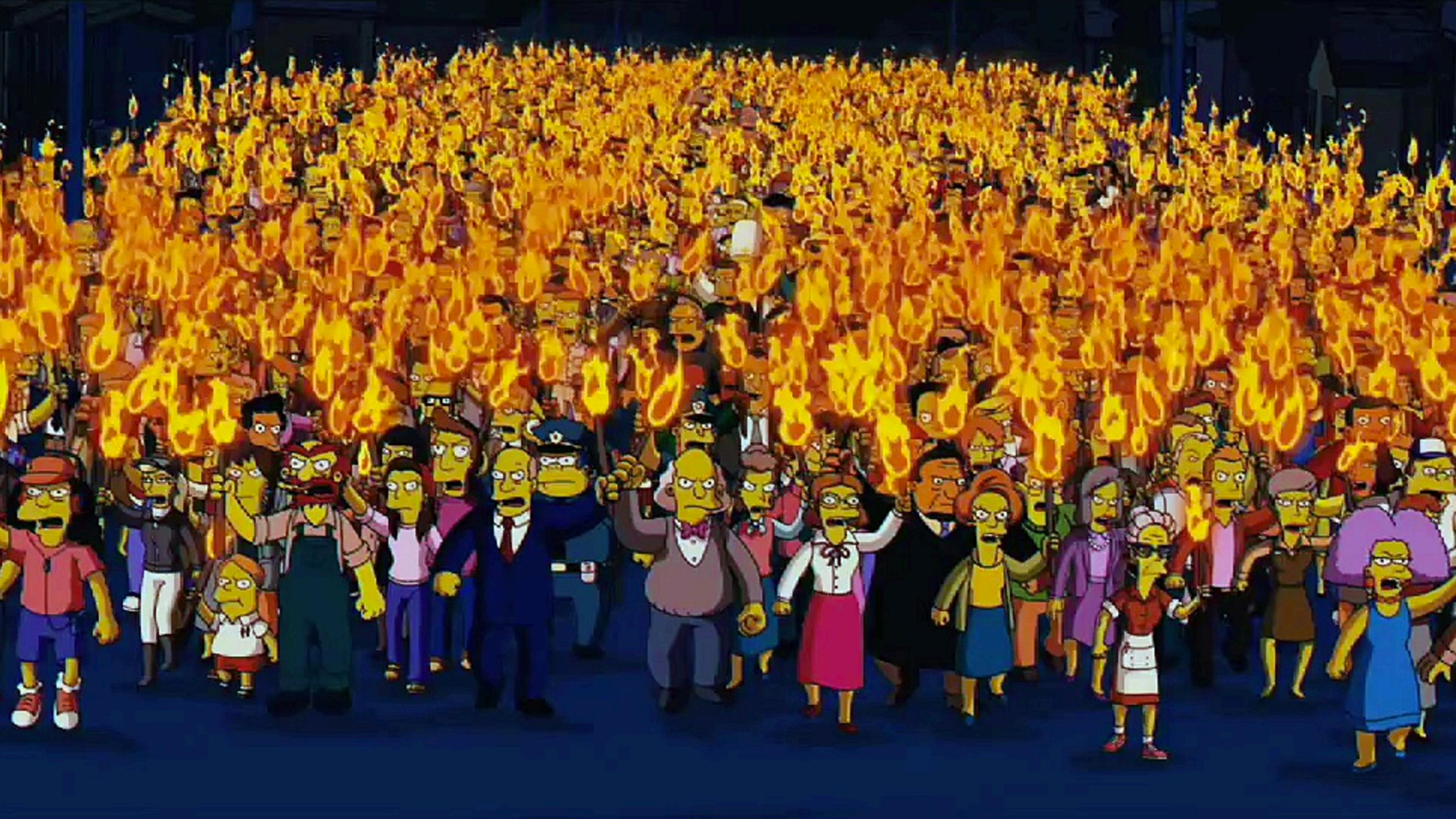




FINAL THOUGHTS

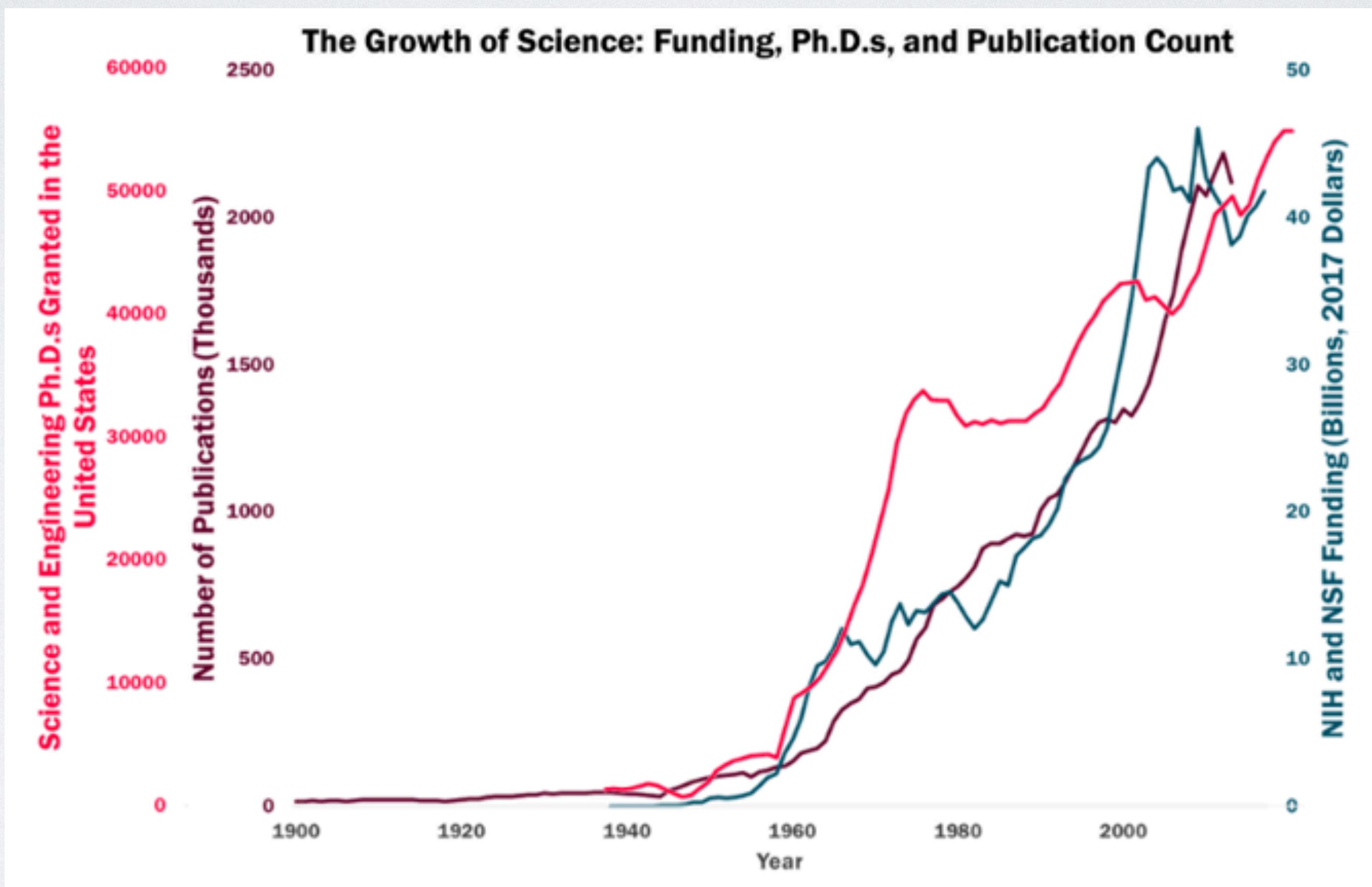
- Option 1: Dedicate our lives to a broken system
- Option 2: Fix the system, and do science right







FOOD FOR THOUGHT



<https://www.theatlantic.com/science/archive/2018/11/diminishing-returns-science/575665/>