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Ethical Issues in Peer Review of Research

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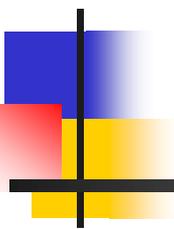
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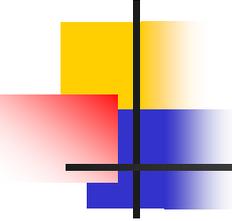
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February 23, 2009

Outline for today

- Publication and peer review
- Prepare roles
 - Professor
 - Student
- Plan role-play
- Run role-play
- General discussion





No research project is complete until the results are published

Whenever an engineer learns something new in technics, it is his bounden duty to put it in writing and see that it is published where it will reach the eyes of his confreres and be always available to them. It is absolutely a crime for any man to die possessed of useful knowledge in which nobody shares.

— John Alexander Low Waddell

Randomizing Functions: Simulation of a Discrete Probability Distribution Using a Source of Unknown Distribution

Sung-il Pae, *Member, IEEE*, and Michael C. Loui, *Fellow, IEEE*

Abstract—In this paper, we characterize functions that simulate independent unbiased coin flips from independent coin flips of unknown bias. We call such functions *randomizing*. Our characterization of randomizing functions enables us to identify the functions that generate the largest average number of fair coin flips from a fixed number of biased coin flips. We show that these optimal functions are efficiently computable. Then we generalize the characterization, and we present a method to simulate an arbitrary rational probability distribution optimally (in terms of the average number of output digits) and efficiently (in terms of computational complexity) from outputs of many-faced dice of unknown distribution. We also study randomizing functions on exhaustive prefix-free sets.

Index Terms—Coin flipping, random number generation, randomizing function, universal coding.

I. INTRODUCTION

A. Motivation

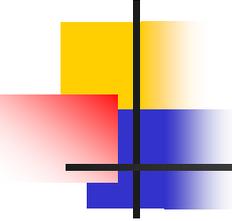
WHEN we toss a coin, we expect it to land *heads* up with probability 0.5 and *tails* with probability 0.5. According to Diaconis *et al.* [1]–[3] however, a coin toss that starts with

TABLE I
A RANDOMIZING FUNCTION FOR $\langle 1/3, 2/3 \rangle$

Input x	Output $f(x)$
HHH	λ
HHT	0
HTH	1
THH	1
HTT	0
THT	1
TTH	1
TTT	λ

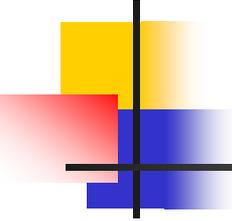
Von Neumann [4] presented a simple method for simulating a fair coin by a biased coin: flip the biased coin twice; if the result is *HT* (respectively *TH*), then output 0 (1), otherwise repeat the process. An important observation is that von Neumann's method works regardless of the bias p of the source coin because $\Pr[HT] = \Pr[TH] = pq$.

Let us consider the function $f_{vN} : \{H, T\}^2 \rightarrow \lambda\{0, 1\}$ defined by $f_{vN}(HT) = 0$, $f_{vN}(TH) = 1$, $f_{vN}(HH) = \lambda$, and $f_{vN}(TT) = \lambda$, where λ is an empty string. Von Neumann's method is abstracted by the function f_{vN} ; applying f_{vN} repeat-



A manuscript submitted for publication is reviewed by peers

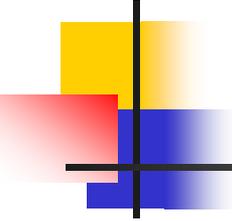
- Manuscript reports research results
- Submission to conference or journal
- Reviewed for quality by experts in subject of manuscript (peers), who
 - Evaluate originality, significance, argument, scope, clarity
 - Suggest improvements



Peer review is used to evaluate manuscripts and grant proposals

Of course, we have a system for judging the value of manuscripts and proposals. It is called a committee of peers. In other words, us. It's a pity there isn't anything better, but that's it. No one else can understand this stuff. Let's face facts—we have enough difficulty ourselves. Somehow I'd prefer something a little bigger than ourselves—something like “consumer reports” for engineering studies. “The following papers are rated unacceptable,” it would say. One hopes one's own paper would be a “best buy.”

—Robert W. Lucky



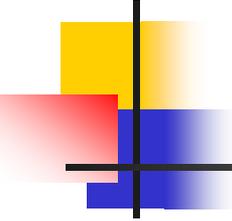
You will run a role-play scenario on ethical issues in peer review

- National Science Foundation
Ethics Education in Science and Engineering
Program, Grant EEC-0628814
- *Role-Play Scenarios for Teaching Responsible
Conduct of Research*

M. C. Loui and C. K. Gunsalus, PIs

Kyoung Jin Kim and Stephanie Seiler, RAs

Bradley Brummel and Kerri Kristich, previous
RAs

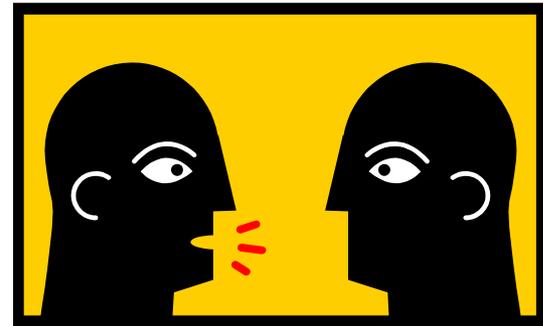


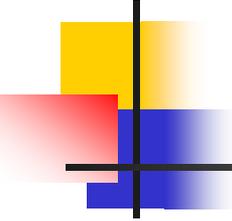
Plan the role-play (ten minutes)

- Each pair has a professor role and a student role
- Professors should take student roles or serve as observers
- Participants with professor role meet in small groups to plan questions to ask the other role-player, and answers for other's questions
- Participants with student role do the same

Run the role-play (ten minutes)

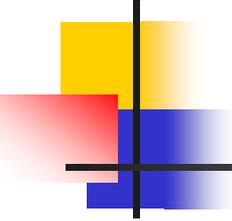
- Return to original pairs
- Run the role-play
- You may use the starter dialogue to start the conversation





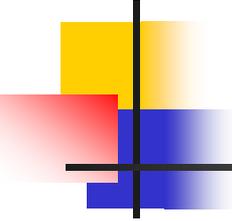
What are the ethical obligations of a peer reviewer?

- To return a thorough report promptly
- To evaluate strengths and weaknesses fairly
- To suggest improvements
- To avoid conflicts of interest
- To honor confidentiality
- To report suspected plagiarism and duplicate publication



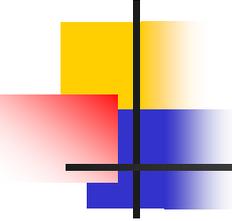
How do these ethical obligations apply in this scenario?

- Should the professor have declined to review this manuscript because of a conflict of interest?
- When a professor is asked to review a manuscript submitted for publication, is it ethical for the professor to give the task to a graduate student?
- Why are the identities of the peer reviewers kept confidential?



Why are the ideas in an unpublished manuscript considered confidential?

- May the reviewer of an unpublished manuscript use its ideas to stop an unproductive line of research?
- May the reviewer of an unpublished manuscript use its ideas to start a new line of research?



Acknowledgments

- This scenario is based on “What is Responsible Peer Review?” http://ccnmtl.columbia.edu/projects/rcr/rcr_authorship/case/index.html#2, which is based on “Confidentiality vs. Mentor Responsibilities: A Conflict of Obligations”, <http://onlineethics.org/cms/16290.aspx>, which is based on a real incident.
- Supported by the National Science Foundation under Grant EEC-0628814. The views, opinions, and conclusions expressed here are not necessarily those of the National Science Foundation or the University of Illinois.