Karon MacLean

Prof @ University of British Columbia

PhD from MIT (1995)

Research keywords: Haptics, robotics, HCI

Projects

CALMER, the non-Mom (Since: 2009)
Designed as a blend, unobtrusive appliance, Calmer is a bed for premature infants that replicates mothers’ breathing movement and heart rate.

CuddleBlitz: Furry Handheld Affective Robot Pals (Since: 2014)
Blitz are one-degree-of-freedom actuated sketches which we use as a design tool to explore rendering of emotion through physical and visual motion.

Handheld Haptics - Untethered Forces (Since: 2017)
Inspired by needs for haptic support of large motions on a surface (in embodied conceptual learning, commercial design, and 2D virtual / augmented reality), we present the ballpoint drive. This novel approach circumvents conventional constraints by imposing a new one: motion restricted to rolling on an arbitrary two dimensional surface, and grounding forces generated through friction.

Haptic Notification and Guidance of Human Motion and Responses (Since: 2005)
SPIN research in haptic notification and movement guidance spans a number of different project arches, as seen through associated publications.

Haptics in Education (Since: 2015)
Educational haptic platforms can leverage various modalities in order create effective interactive environments that can support embodied physical interactions. These platforms have the potential to leverage a student’s physical intuition to make abstract topics in physics, math, and other fields of science more concrete.
Administrivia

Draft proposal due next Thurs (5/24)

Peer reviews after that; Monday groups will need to reschedule for Memorial Day

Next week, a CTL staff member will be observing the classroom
Today’s goals

What is publication culture? What are conferences, journals, arXiv, and what role do they play?

What happens after you write a paper?

What peer review is, why it matters, and how it works

How to develop a high-quality review

Dealing with disappointment
Publication culture
I finished the paper. Now what?

Now it’s time for your research to take flight and enter the academic record.

...but why do we do this? Why care? And what are even the options?
Why do we do this?

There is a massive amount of research generated each year in computer science. (If you want to drink from the firehose, subscribe to daily announcements from arXiv.org.)

So what do you pay attention to?
An example in CS Theory

Amongst the papers written in Computer Science theory, the vast majority of them are correct proofs.

So, researchers in CS Theory are faced with a large pile of true facts about the world.

The role of the top-tier conferences is to establish which of those true facts are the most important ones.

(And yes, also to weed out any incorrect proofs.)
Typical gold standard: conference

Computer Science, unlike other fields, is a conference-oriented field.

There are a small set of top-tier conferences for each area. These are generally known to be the venues that publish the best work in the area.

There also exist a variety of second-tier and other conferences, which are less prestigious and often easier to get into.

Journals, and conference-journal hybrids, fit into this category too.
Work-in-progress venues

You can only publish a research result once. Conferences and journals are known as **archival**, meaning that they are archived permanently in the academic record.

There also exist a variety of **non-archival venues** that are intended for feedback and exposure.

- Workshops
- Posters
- Demos
- arXiv.org
Life of a paper

Write paper → Pick a venue → Submit to venue → Get reviews → Revise or rebut → Accepted or rejected
“WIP venues sound fun...”

They should! VPUE provides Conference Grants for up to $1,500 to travel to present your research at a conference.

If you’re interested, ask your TA or mentor!

They can work with you to identify a reasonable non-archival venue to submit to, and point you at the format requirements.

http://studentgrants.stanford.edu/
Peer review
The dual role of peer review

You can always put your paper on a public report archive such as arXiv.org. But getting your research into a conference requires peer review.

Peer review relies on experts in the field to judge two questions:

1) Is this research correct? Does it actually achieve what it claims?
2) Is the contribution valuable enough to publish at this venue?
Who are the peers?

Ideally, your paper gets routed to people who are experts in the topic of your research.

- People who publish in the area that you’re working in
- People who you cite in your submission
Anatomy of a peer review

Exact details vary, but most reviews contain the following elements:

Overall score: 1-5

Textual review (~5 paragraphs)

<table>
<thead>
<tr>
<th>Reviewer</th>
<th>Role</th>
<th>Score</th>
<th>Review</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewer 4</td>
<td>1AC</td>
<td></td>
<td>review 4</td>
<td></td>
</tr>
<tr>
<td>Reviewer 3</td>
<td>2AC</td>
<td>4.0</td>
<td>review 3</td>
<td></td>
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<tr>
<td>Reviewer 1</td>
<td>reviewer</td>
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<td>review 1</td>
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</tr>
<tr>
<td>Reviewer 2</td>
<td>reviewer</td>
<td>4.0</td>
<td>review 2</td>
<td></td>
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</tbody>
</table>
The process

**External review model**

Associate Chair (AC)
Secondary Chair (2AC)

Think and invite

Invited reviewer 1
Invited reviewer 2

**Internal review model**

Senior Committee Member (SPC)
Senior Committee Member (SPC)

Assign out of a pre-recruited pool

Committee member 1
Committee member 2

Convene at a program committee (PC) meeting, where they discuss borderline papers (most papers)
Double-anonymous review

Typically, when you submit a paper to a conference, you anonymize yourself by not including your name or affiliation in the author block of the paper.

Goal: ensure that papers are reviewed on content, not on reputation

Likewise ACs’ and reviewers’ identities are hidden from the authors

Goal: avoid retaliatory behavior, focus on the institution of peer review rather than the people
What happens with reviews?

Based on the aggregate reviews, senior members (AC/SPC) make a recommendation. Conference acceptance rates are often ~25%.

Example score distribution from a top-tier conference
Rebuttal and revision

Some conferences use rebuttals, where you have a short period of time (~1 week) to reply to the reviews. Reviewers read your rebuttal, adjust scores if desired, and then a final decision is made.

Other conferences and all journals use revisions, where a paper is given a specified period of time (a few weeks to a few months) to directly make changes based on the reviews. Reviewers read the revised paper, adjust scores if desired, and then a decision is made.
The social influence of contributions

Who are the people involved when doing research? What are their backgrounds and values?

I guess we can measure that.

OK, let's design a rat car that will automatically evade cat prey patterns.

I love this and also I'm very senior so my colleagues will listen to me.

This is important!

Hmm, let's ask another person.

I'm a cat and I hate this.

As long as it can generalize to all cats.

Sounds good!

I think giving rats little cars will make them happier.

You can't quantify happiness.

Let's focus on the algorithm for rat steering instead.

What about humans? Cars didn't make us happier.

OK, let's design a rat car that will automatically evade cat prey patterns.

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How to write an effective review
The tempting behavior

1) Read the paper
2) Keep track of objections you have as you read the paper
3) Collate those objections into a review
4) Decide what score to give based on your objections

Take 2 minutes to brainstorm with the person next to you why this might not be the best approach.
What does this behavior cause?

This winds up with nitpicky reviews: here’s what’s wrong, without placing those issues in context of the broader contribution.
Writing a good review

Step one: ask yourself, **what goal is the paper trying to achieve?**

This may not be super clear from the paper. As a reviewer, your goal is to figure out what the bit flip is that they are arguing for, even if the authors aren’t great at articulating it themselves.

Step two: **how well did the paper achieve that goal?**

Did they follow through on what their goal was? Did they demonstrate their thesis well?

Step three: **how could it have better achieved that goal?**

This is where you offer constructive critiques.
Writing a good review

Once you’ve taken those three steps, you can translate the result into a review. Essentially (but in your own words):

This paper sets out to [goal]. [Goal] is...

An important goal and well executed...

Making an implicit assumption that I disagree with...

(If relevant:) the execution...

Is an excellent exploration of [goal]

Doesn’t follow through on [goal] in the following way: [...] 

(The execution may be a secondary matter if the goal is ill-formed!)
Jingyi’s review process

1. Read and annotate the PDF, paying attention to their argument laying out the contribution in the introduction, and how the rest of the paper supports (or not) the contribution

2. Take notes, outlining the main points

3. Convert notes into review text. Reviews should always start by summarizing the contribution of the paper, and touch on positives, and points for improvement. It’s often the only feedback authors get for a year of hard work, so be kind!
What questions do you have?
Try it

Think back to your nearest neighbor paper. Take seven minutes to construct a review of that paper.

What goal is the paper trying to achieve?

This paper clearly articulated its objective/goal. (1: strong disagree, 5: strong agree)

How well does it achieve that goal?

This paper clearly achieved its objective/goal. (1: strong disagree, 5: strong agree)

How could the paper have better achieved that goal?

[7 min] Construct a review of your nearest neighbor paper.

http://tiny.cc/cs197-review
Peer reviewing proposals

Proposal reviews focus more on the articulation of the problem itself.

What goal is the paper trying to achieve?

This paper clearly articulated its objective/goal. (1: strong disagree, 5: strong agree)

How well does it achieve that goal?

This paper clearly achieved its objective/goal. (1: strong disagree, 5: strong agree)

How could the paper have better achieved that goal?
Dealing with rejection
Rejection is a fact of life in research.

My first paper submission got flatly rejected.

Rejection hurts!
Most of what I try fails, but these failures are often invisible, while the successes are visible. I have noticed that this sometimes gives others the impression that most things work out for me. As a result, they are more likely to attribute their own failures to themselves, rather than the fact that the world is stochastic, applications are crapshoots, and selection committees and referees have bad days. This CV of Failures is an attempt to balance the record and provide some perspective.

This idea is not mine, but due to a wonderful article in Nature by Melanie I. Stefan, who is a Lecturer in the School of Biomedical Sciences at the University of Edinburgh. You can find her original article here, her website here, her publications here, and follow her on Twitter under @MelanieStefan.

I am also not the first academic to post their CV of failures. Earlier examples are here, here, here, and here.

This CV is unlikely to be complete – it was written from memory and probably omits a lot of stuff. So if it’s shorter than yours, it’s likely because you have better memory, or because you’re better at trying things than me.

Degree programs I did not get into

<table>
<thead>
<tr>
<th>Year</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>PhD Program in Economics, Stockholm School of Economics</td>
</tr>
</tbody>
</table>
| 2003 | Graduate Course in Medicine, Cambridge University  
      | Graduate Course in Medicine, UCL             |
      | PhD Program in Psychology, Harvard University |
      | PhD Program in Neuroscience and Psychology, Stanford University |
| 1999 | BA in International Relations, London School of Economics |
We are pleased to inform you that your paper has been accepted

As a grad student  As junior faculty  As tenured faculty

From: https://researchinprogress.tumblr.com/post/33884075941/we-are-pleased-to-inform-you-that-your-paper-has
We regret to inform you that your paper has not been accepted.

As a grad student
As junior faculty
As tenured faculty

From: https://researchinprogress.tumblr.com/post/33946389387/we-regret-to-inform-you-that-your-paper-has-not
How to handle bad reviews

First, take the time you need to emotionally process it. Most people’s process basically follows the Kübler-Ross model:

1. Denial and isolation
2. Anger
3. Bargaining
4. Depression
5. Acceptance

This is a very natural human reaction, and not one we directly have control over, so just let it happen.
Making the most of it

I see two common clusters of bad reviews:

1) People who don’t get the paper. These reviews don’t engage with the core idea, or engage with the wrong aspects of the idea, and their critiques come across as surface-level as a result.

2) People who get the paper. These reviews are often really incisive and take down core assumptions or approaches you’re taking.

Each of these clusters has something to tell us about our paper.
“They don’t get it”

These reviews suggest one of two things:

1) Your paper didn’t get in front of the right kind of reviewer, like it didn’t hit someone who works in the right area.
   
   (Then: what are you signaling in your title or abstract that is attracting the wrong kind of reviewer?)

2) Your paper got in front of the right kind of reviewer, but they didn’t connect with your idea

   (Let’s talk about Plato’s Cave...)
Plato’s Cave

Your brilliant idea

The shadow cast by the paper you actually wrote

What reviewers thought you were saying

The shadow cast by their reaction in the review you read
Plato’s Cave

Your brilliant idea

The shadow cast by the paper you actually wrote

What reviewers thought you were saying

The shadow cast by their reaction in the review you read

Your goal: invert the transformation to understand what really needs to change about your idea or its presentation.

Corollary: don’t take the feedback literally.
“They get it”

These reviews are the really good kind of burn. It hurts because they’re right.

You can shortcut the Plato’s Cave process here, and take their advice more at face value.
Possible outcomes

Non-exclusive options

Reframe the paper: reconsider your bit flip ("what is the goal?")

Perform additional engineering or evaluation work ("how well did the paper achieve the goal?")
Revise and resubmit

It’s not so uncommon to transition a paper from a flat-out reject to a Best Paper winner.

Did those papers get in front of more sympathetic reviewers? Maybe.

Did those papers benefit from a more refined vision, execution, and articulation? Absolutely.

In some cases, rejection is actually the best outcome. I’d rather have a paper rejected, iterate, and then win an award, than barely get a paper accepted and never have the impact it could have had.
Your To-dos

Draft paper + timeline/reflection next Thursday

Be prepared for peer review after!

Exit ticket: http://tiny.cc/cs197-week8
Computer Science Research

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