

Third time's a charm

—My CAREER tips—

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My CAREER journey

2012-2016

Research scientist (soft money position)
Extensive experience writing grant proposals

2017

Started as asst. professor
Applied for CAREER — Declined (LC)

2018

Polished and resubmitted CAREER — Declined (LC)

2019

Clean-slate CAREER proposal — Awarded (HC)

My CAREER journey

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My big mistakes

I thought it had to be unrealistically ambitious

I was not the right person to do the proposed work

"How am I supposed to know 5 years from now?"

My CAREER journey

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"How am I supposed to know 5 years from now?"

2018

Polished and resubmitted CAREER — Rejected (LC)

I thought I was just making minor mistakes

Addressing my early mistakes

I thought it had to be unrealistically ambitious



I chose a *new problem* that I knew I could do and that I had **years of ideas** about

I was not the right person to do the proposed work



I had published on it, and I deeply knew the prior work

"How am I supposed to know 5 years from now?"



I looked at it more as an *agenda* with goals that extended **beyond the 5 years**

My CAREER proposal tips

It's a grant...

General proposal tips

...with a couple differences

CAREER-specific tips

General proposal tips

Put yourself in the shoes of those evaluating you

Organization adds clarity (to the reader and to you)

- Serve on a panel
- Clearly delineate prior vs. proposed work
- Problem → Thrusts → Research tasks → Artifacts
- Each thrust necessary; All thrusts collectively sufficient

I spend ~80% of my time on the 1-page summary,
Organizing ideas into thrusts;
Organizing thrusts into an overall theme

General proposal tips

Put yourself in the shoes of those evaluating you

Organization adds clarity (to the reader and to you)

"This is worth looking into"
Not "This is *the* solution"

Mitigate risk;
Don't totally eliminate it

Evaluation plans clarify your goals

- Serve on a panel
- Clearly delineate prior vs. proposed work
- Problem → Thrusts → Research tasks → Artifacts
- Each thrust necessary; All thrusts collectively sufficient
- Problem formulations & goals should be precise
- Proposed solutions should be well-reasoned
- Why do you think it will work out? What if it doesn't?
- Ambition is great! But a project resulting in nothing isn't
- What you are measuring tells what your goals are
- Weave evaluation plans in with "If successful" sentences

The power of "If successful" sentences

Papers

Convince the reader: this is the solution

Proposals

Convince the reader: this is worth looking into

"If successful, [the thing I proposed] will result in [ideal outcome]."

- Clarifies **what you are trying to do** by specifying the end goal
- Clarifies how you are **defining success**
- Establishes the "**best case scenario**"
- Clarifies your **evaluation metrics** ("fastest", "most anonymous")

Some of my "if successful"s

Research

If successful, the AI we build and deploy and the measurements we perform will lend deeper insight into how sensors work, how to circumvent them, how their systems fail, and how they update them over time.

Clarifies what I'm doing
Building, deploying, measuring

Clarifies desired outcomes
Understanding, circumvention,
longitudinal results

Education

If successful, Breakerspace will lead to new research opportunities for dozens more of undergraduates within my group, and will serve as a template for scaling-up undergraduate research nationwide.

Clarifies desired outcomes
More undergrad research;
Local and nationwide impact

What makes the CAREER different?

CAREER is strictly for
tenure-track faculty

Education Plan

Very long timescale
for a single-PI grant (5 yrs)

Defining an Agenda

Education Plan

How to

"Approach it the way you approach your science"

Problem

Proposed solution

Evaluation plan

Disseminating
results

None of these have to be novel!

There are many good, existing solutions that need more deployment

Make them specific to your school

Motivate with data; target problems and leverage existing programs

This is probably a bigger task than you expect

Learn your school's resources; establish educational collaborators

Problem

- Undergrad research does not scale
- **Motivated with real data** (UMD and US)

Proposed solution

- Run a lab designed for group projects on proposed research
- **Prior results:** Ran it for 2 years

Evaluation plan

- Surveys (cognitive engagement, post-BS plans, outcomes)
- Done in collaboration with **existing campus resources**

Disseminating results

- **Resources to help teach faculty** from all schools
how to run large group undergrad projects

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Defining an Agenda

Defining an Agenda

How to

How am I supposed to know what I'm working on in 5 years?

Nobody expects you to know in detail!

"Year 5: Tell a story.
Provide a beacon on the hill"

The CAREER is an agenda;
Where is it all leading?

Year 1

Precise

Year 2

Precise

Year 3

Decent idea

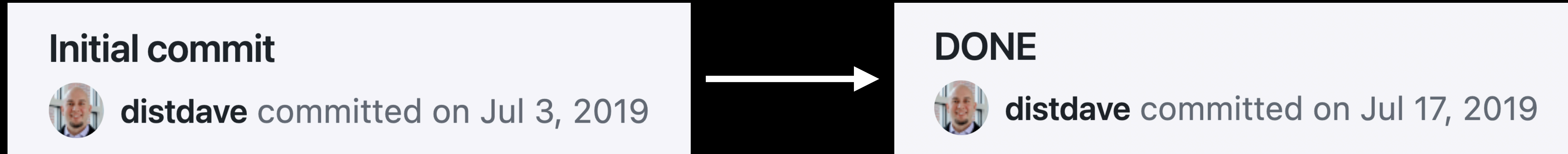
Year 4

Problem known;
Possible solutions

Year 5

Vision:
Potential problem space

My CAREER timeline



What's not shown here

- ~2 years of brainstorming ideas and getting prior results
- 2+ years of building my edu plan
- Had early (non-NSF) seed funding that led to preliminary results

What I wish I did differently

- Attend the CAREER writing workshop earlier!

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...with a couple differences

General proposal tips

- Goal: "This is worth looking into"
- Organization & eval plan clarify
- Serve on a panel

CAREER-specific tips

- **Education**: Bigger, more integrated
- Year 5 is the vision of where your **agenda** will lead

It's a great program—give it a shot!—but don't let it define you