Signal Kinetics Lab

cartesian

Prompt:

Tell me about your research

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I will start…

I invent & build new wireless technologies to **decode hidden worlds** around us

For example, we invented a technology that uses <u>WiFi to see through walls</u>

We're also creating the world's first <u>ocean IoT</u> to discover the hidden underwater world

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Tell me about your research

I would like to ask few people to go

This is a very hard but very important exercise!

Your Research Pitch

When will you need it?

- *When applying for faculty positions*
  - *Research statement + job talk*
- *When applying for faculty fellowships / funding awards*
  - *NSF CAREER, Sloan, etc.*
- *When applying for faculty promotion, tenure, full, …*

Your Research Pitch

When will you need it?

- *When attending a conference*
- *When meeting other professors and students in any academic setting*
- *When you meet anyone in a professional setting*
- *When meeting friends & family in a non-academic setting*
- *When applying for faculty positions*
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- *When applying for faculty promotion, tenure, full, …*
- *When you meet potential sponsors*
- *When you speak to the public media*
- *When you meet heads of states/presidents, policymakers*

Objectives of this Talk

Gain insights into the challenges and approaches to talk about your work

1. Why do you need a research pitch?

2. What are the common challenges in creating pitches?

3. What are three key questions to ask yourself when crafting a pitch?

4. What are the three axes of a research pitch?

5. How does your research pitch evolve over your career?

Three questions to ask yourself to avoid these pitfalls

The level of details that you share

Too superficial / fluffy ←——————————————————————————→ Too detailed / technical

1. *Who is your audience?*
2. *What is your purpose?*
3. *[…]*

- *Why should they care? What's in it for them?*
- *What are you trying to get out?*

The biggest problem I've seen: obscurity via technical details for the sake of sounding smart

— you are unlikely to impress experts if you do this

— people won't remember what you do, diminishing your impact

One of the best strategies to sounding smart & knowledgeable?

1. Explain an exciting problem, in the **clearest** possible sense
2. Ask the audience how they would solve this problem

   pause and give them time to think

3. Then, give the answer (& show it if you can!)

Why does this work?

Because (a) it engages the audience

　　　　(b) it demonstrates the problem is hard

Let's do an example

Can we see through walls with WiFi?

Wireless device in another room

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Levels of research pitch

- *Individual research project*
- *Dissertation — a theme with multiple projects*
- *Research agenda — a mission with multiple axes/themes*

There's a lot of commonalities but also a few differences

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How do we go from a set of projects to a theme/agenda?

Let's do another example

(a bad one)

I'll give my dissertation example

- *We can track people through walls with WiFi*
- *We can also get their gestures*
- *We can also get their breathing and heartbeats*
- *We can also capture their poses through the wall*

… now it starts to feel like a laundry list of also's

Maybe it's impressive, but what's the theme?

Here's a theme

WiFi has been traditionally used for communication

<u>in contrast</u>

I show that it can be used to sense humans & the environment, without any body contact

- *We can track people through walls with WiFi*
- *We can also get their gestures*
- *We can also get their breathing and heartbeats*
- *We can also capture their poses through the wall*

this enables many applications in smart environments, health monitoring, security

and all this is just the beginning of scratching the possibilities of WiFi sensing

Can we come up with another theme?

Traditionally, sensing the human body requires placing sensors on the body (like wearables)

in contrast

I show that we can sense the human body without any contact, by relying on wireless signals in the environment

- *We can track people through walls with WiFi*
- *We can also get their gestures*
- *We can also get their breathing and heartbeats*
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What do these two examples have in common?

The three axes of a research pitch

The "What"	*Describe a problem or status quo that the <u>audience</u> understands & can relate to, then contrasting with what's different about your work*
The "How"	*Articulate how you're doing it — invite curiosity about the techniques [follow-ons to demonstrate challenges + innovative techniques]*
The "Why"	*Highlighting why it matters — i.e., what its impact will be (and why others should care)*

A couple of things to keep in mind…

Nothing supersedes great research

*But pitching it effectively helps make it **and** you shine*

You shouldn't oversell or undersell

give the right context (prior work)

Not everybody will like your pitch

… but that is fine

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As you progress in your career, you will be able to articulate broader questions that you aim to answer

Research Agenda - My Lab as an Example

- *We do research on wireless sensing, robotics, ocean IoT, healthcare, RFID…*

  sounds like a potpourri of projects

  I could just say I do wireless systems

  … and get away with it

  But, when I give a talk, I like to articulate what drives this mission

  So what's a good way of tying these together?
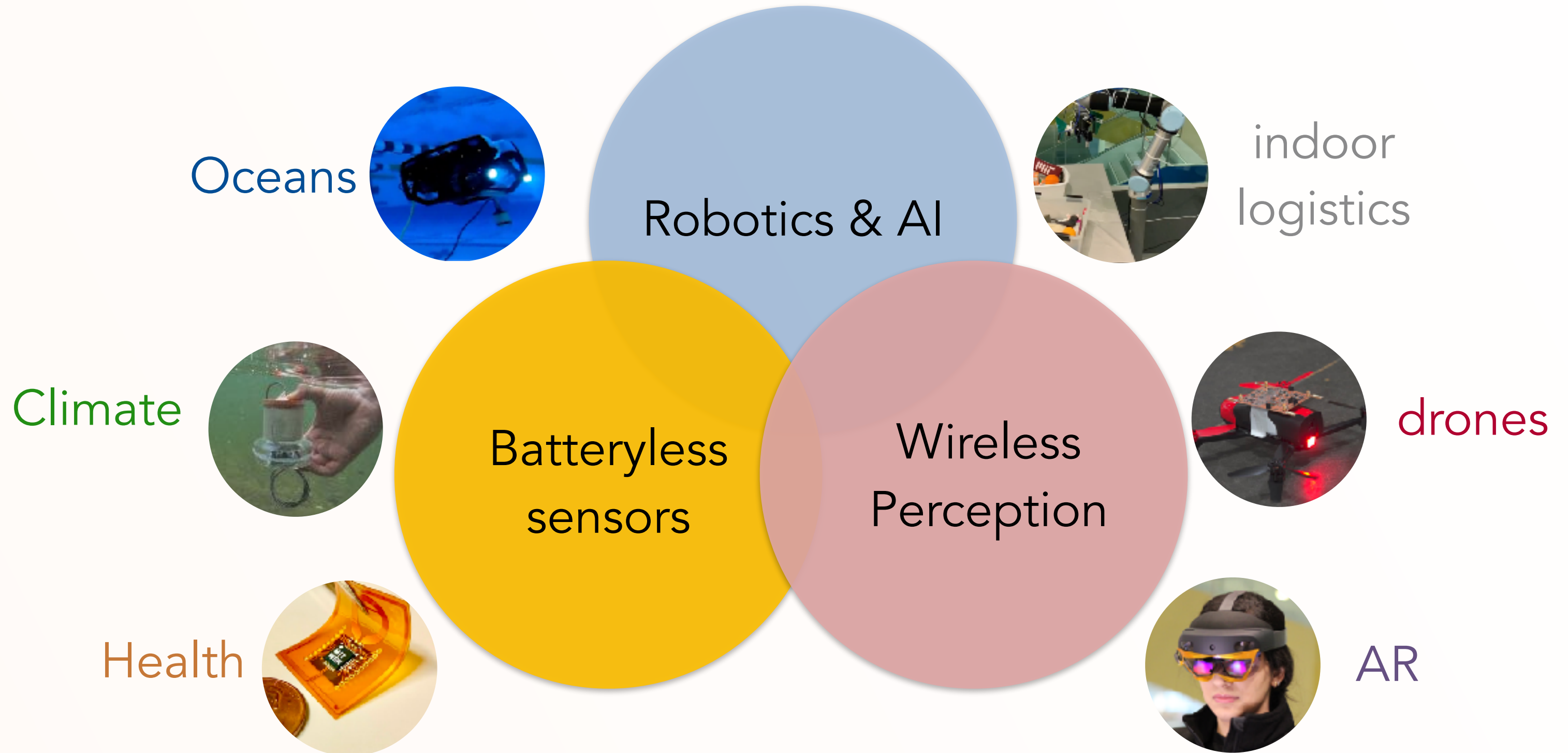
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- *We do research on wireless sensing, robotics, ocean IoT, healthcare, RFID…*

Academic Talk: *"Decoding Hidden Worlds: Wireless & Sensor Technologies for Oceans, Health, and Robotics"*

Broader Talk: *"Decoding Hidden Worlds: From Moonshot Inventions to Real-World Impact"*

Decoding Hidden Worlds
Wireless & Sensor Technologies for Oceans, Health, & Robotics

Oceans

Robotics & AI

indoor logistics

Climate

Batteryless sensors

Wireless Perception

drones

Health

AR

Three questions to ask yourself to avoid the pitfalls of a bad pitch

1. *Who is your audience?*

2. *What is your purpose?*

3. *What excites <u>you</u>?*

The biggest problem I've seen: obscurity / technical to sound smart

The biggest <u>missed opportunity</u>: lack of excitement

*if you're not excited about **your** project, how can you expect others to be?*

FAQ: Do I need to figure out my 5-year pitch in advance?

No

Find a unifying theme that works for you now, and use it

Ask for feedback

Try it on people

  you'll realize different things work for different people

Remember: It will change over the course of your career

It's too hard & important, so don't wing it

Have a pitch ready now at 3 different levels:

1. Someone in your area

2. Broader professional setting

3. Public / media / president

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