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The Art of Presentations

Excellent public speaking skills are essential, no matter what you do

Feedback from the audience

- You will often hear —
  - The talk was not so good.
  - The talk went over time.
  - I have no idea what she is talking about.
  - I was checking my emails.

I fell asleep.

In fact, good talks are a rare find

But why? What's the problem?

- The talk is not organized well.
  - Problems in organizing and preparing for a talk
- No one can finish reading the slides.
  - Problems in preparing slides
- The speaker talks with a monotone tone.
  - Problems in delivering a talk

How to solve these problems and give a good talk?

Three

General Rules of Thumb

Rule #1: keep it simple

Less is more

- The fact that your talk is simple, doesn't mean that you are not a good researcher
- If you make your talk complex, you run even higher risks, because it's hard to understand in a short period of time!

You will never be able to "dazzle the audience" with complexity

Instead, you push them away from your talk

Rule #2: be enthusiastic

You worked very hard to get this opportunity

If you want anyone else to be excited about your work, you should be the first

Be enthusiastic

- Body language and tone of voice supply the overall message impact
  - Use hand gesture
  - Use maximum power in voice
  - Avoid a monotone tone

Rule #3: practice your talk

It is a show — that's why it needs to be rehearsed

Practicing your talk only makes it better

Practice, practice, practice

- first in your mind
- then in front of a friendly audience (like a research group)
- in front of your advisor
- get feedback and improve your talk
- iterate the above many times

Practicing may help you build your confidence

Why am I nervous before the talk?

We all fear what we don't know

Without practice, you may not remember what the upcoming slides are

So after lots of practice, you can take a deep breadth and get started

Three Rules of Thumb

Rule #1: keep it simple

Rule #2: be enthusiastic

Rule #3: practice your talk

Organizing and preparing your talk

Have one, not two, take away message

This is something for the audience to remember

People in the audience can't just remember anything they like — you control what they do remember

That is your take away message in the talk

Always assume that the audience is 80 years old with a poor memory

Tips on the take away message

- Be explicit about what you wish them to remember
- You do not have to tell the audience everything for them to understand something
- Repeat the take away message

Spend a lot of time to work on the flow of ideas in your talk

Start with a pen and paper,
like working on a movie

Think about the following questions while working on your flow of ideas

- What is the purpose of the talk?
- How long will the talk be?
- What is my take away message?

Once I have a logical and natural flow of ideas, I can even remove the “outline”

What do you think about the next slide?

Outline of the talk

- Problems in content distribution systems
- Related works on peer-to-peer content distribution
- The design of our scheme on large-scale content distribution using cloud assistance
- Theoretical analysis of our scheme
- Simulation results
- Conclusion

I think it's boring

Once you are confident with your flow of ideas, just guide the audience on your tour

Your audience will be happy to follow the flow and go for a ride — they enjoy the ride!

Your flow does not have to be traditional: background — design — simulation

It can be anything you want

You can even make it a roller coaster ride with twists and suspense

Organizing and preparing your talk

- Deliver one, and simple, take away message
- Spend a lot of time to work on the flow of ideas in your talk
- Take the audience on a ride that they enjoy and won't forget!

Designing slides

Two tips you can keep in mind

Tip #1: you are the boss,
not your slides

The best speakers attract all the attention from the audience

Your slides are a visual aid

They are your assistants

You will always be the boss

The audience should never pay more attention to your assistants, no matter how good looking they are!

Some students ask me for

"slides" after my talks

They wanted slides for good reasons

Most speakers include all the information they are going to talk about in their slides

That makes the assistants

the boss

Good speakers are not prepared to do this

If you have their slides, you will not reproduce what they talked about

Because the slides contain much less information than the talk

Tip #2: keep slides simple

Presentations should be

"zen"-like

What do you think about the next slide?

Gender equality in Japan

- According to the latest reports from the Japanese Ministry of Labour, 72% of part-time workers in Japan are women. This is the highest ratio reported yet. The number of part-time workers has been increasing for years. For many women, full-time employment is not available, or their family obligations make it impossible for them to keep full-time hours. Below are some comments from some prominent Japanese politicians:

- “Japanese work office environment is not yet conducive for promoting gender equality.”
- “The conservatives ... wanted to keep the Japanese society traditional.”

How about this?

72% of part-time workers in Japan are women

Or even better —

72%

When the slide is simple,
there is nothing to distract
the attention of the audience

The attention of the audience is a precious resource that you wish to attract, not distract!

When there is very little to read, they will focus on you, the boss

Otherwise, they will read the slides until they finish reading!

And if you advance to the next slide before they finish, they will become nervous, and read more quickly!

Bullets can be your enemy

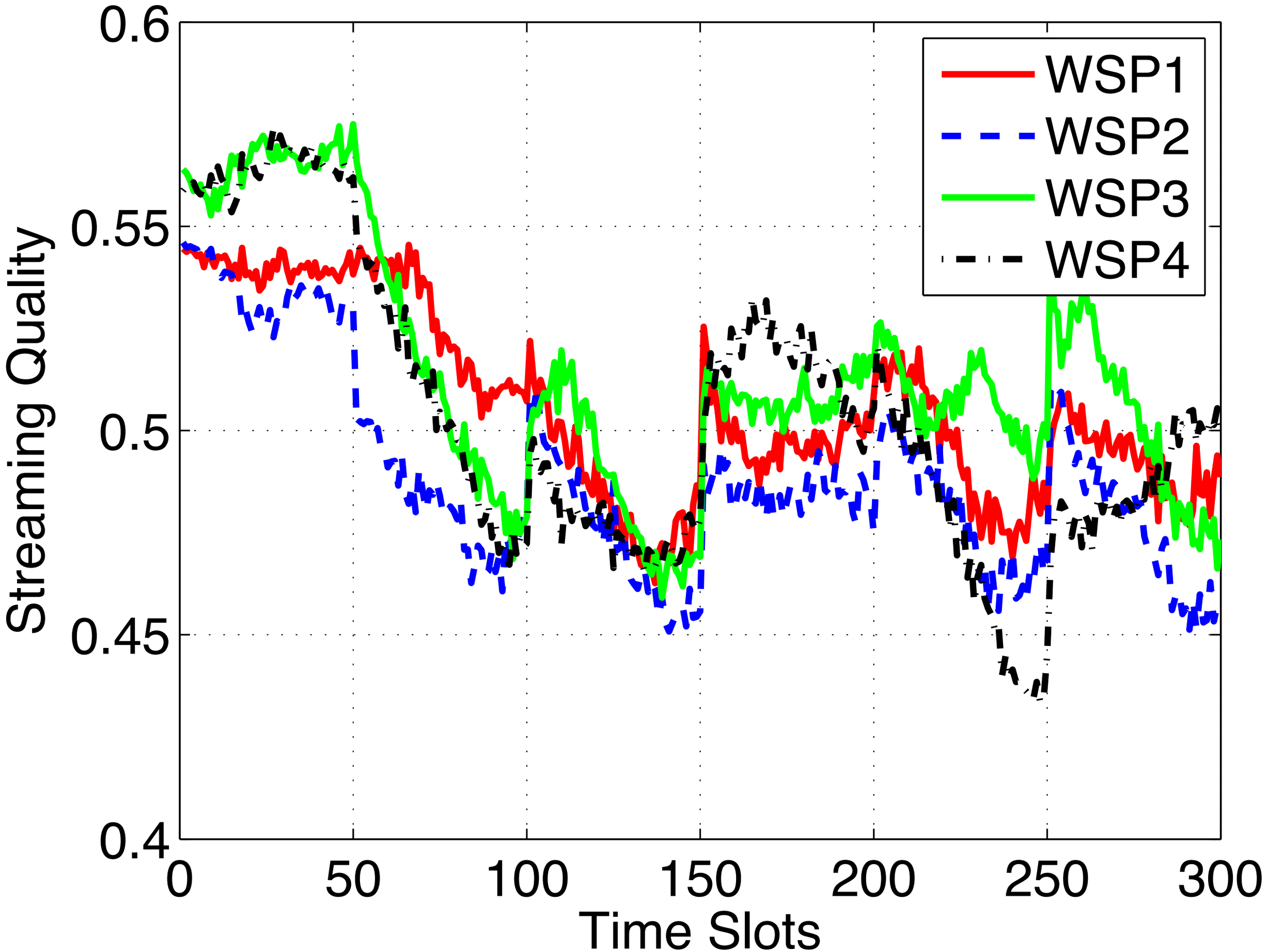
- Do not bore the audience with bullets after bullets
- The best slide may have no bullets at all!

Tips for keeping it simple

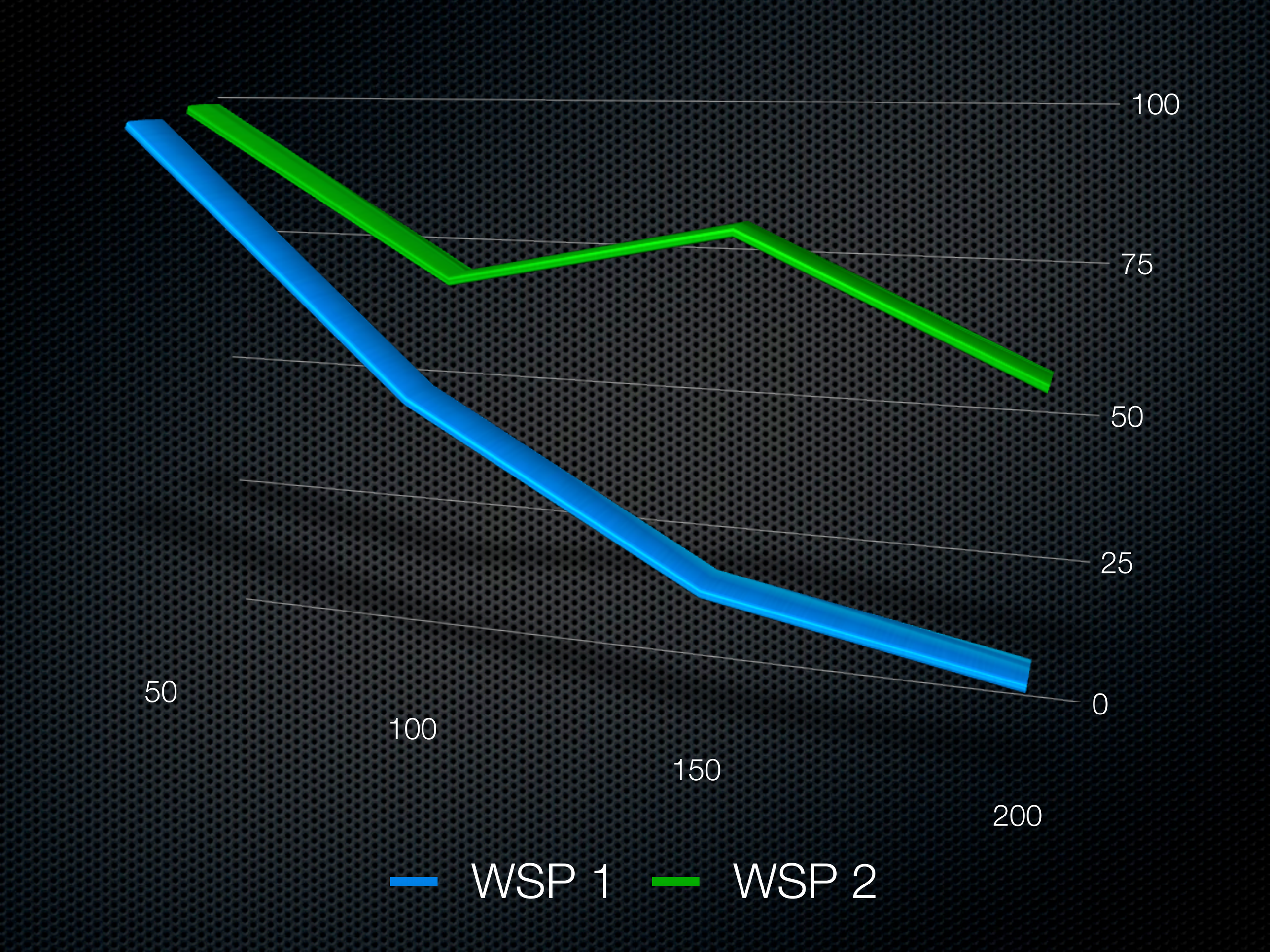
- More photos and graphics — reduce text
- Have plenty of empty space
- Use huge font sizes — your audience is 80 years old, remember?
  - Sans-serif fonts are the best

Simplify your figures and make them easier to understand

Would you wish to see this?


0.6
0.55
0.5
0.45
0.4
Streaming Quality
0
50
100
150
200
250
300
Time Slots
WSP1
WSP2
WSP3
WSP4

Or this?


100
75
50
25
0
50
100
150
200
WSP 1
WSP 2

Keep animations and transitions simple

- Use animations and slide transitions carefully
  - Not too frequent or too fancy
  - Keep animations and transitions subtle
- If you have bullets, use builds

Designing slides

- Tip #1: you are the boss, not your slides
- Tip #2: keep your slides simple

Delivering your talk

Tip #1: once again, show your passion

Show your passion

- You need a deep, heartfelt belief in your work
- World-class speakers are able to connect with an audience in an honest and exciting way

Tip #2: open your talk with a bang

Like chess, a good opening in your talk is critical — it grabs attention

Design your opening well

- The audience is most alert during the first 60 seconds of the talk, use it wisely!
- Don’t spend the first few minutes talking about lots of background information or outline of the talk

Tip #3: close your talk with a lasting impression

As in gymnastics, a good closing is important — do not rush the closing!

Tip #4: control the pace of your talk well

Controlling your pace well

- Slow down — the one-way communication channel from you to the audience is lossy!
- Be on time — use a presenter display to know how much time you have left
  - It is fine to close a bit early
- Use a remote control — so that you can walk around

Tip #5: connect with the audience

Connect with the audience

- Move away from the podium — remove physical barriers between you and the audience to make it easy to connect
- Make eye contact — do not look at your laptop display
- Use body language and gestures — it can become very powerful to connect
- Talk to the audience — not to the projector screen!

Tip #6: do not try to memorize

Do not try to memorize the narrative in your talk

- You will forget everything, anyway
- Remember the logical flow of ideas — there are a million ways of delivering the same flow

Tip #7: There is no need for notes

You won’t have time to look at your notes, anyway

Delivering your talk

- Tip #1: once again, show your passion
- Tip #2: open your talk with a bang
- Tip #3: close your talk with a lasting impression
- Tip #4: control the pace of your talk well
- Tip #5: connect with the audience
- Tip #6: do not try to memorize
- Tip #7: There is no need for notes

A Roadmap to Good Research

Or: How do I graduate with great papers?

RESEARCH

R	Read
E	Evaluate
S	Synthesize
E	Educate
A	Act
R	Record
C	Create
H	Heart

Curtesy of Pas Pasupathy,
Univ. of Toronto

Okay, I have the “heart” for research — now where is the idea, to get started with the other letters?

Getting started

You need to choose a research topic that excites you the most

Or, at the very least, interesting to you

Most students tend to choose a “hot” topic

There is one underlying assumption if you choose a "hot" topic

A “hot” topic reflects the passion of many other researchers, so it must be very interesting to me

This may, or may not, hold

But even if the assumption holds, there are two pitfalls

First — “change”

The passion of other researchers changes over time — a “hot” topic may not be “hot” next year, when I bring new research results to the community

Second, “follow or be against the trend”

Following the trend may lead to “incremental” results,

which is less exciting and less important — lower quality

Be against the trend may lead to groundbreaking work that can be seminal

Advice: follow your heart,
not someone else's

R Read

E Evaluate

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But now I need to know what the topic is all about!

You need to read existing books and papers

R Read

E Evaluate

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Goal: become an expert in the topic

But how?

Start with one paper

Yes — start with one paper

- that is important, a landmark or a breakthrough in the research direction
- that has been cited frequently
- that has a long bibliography (possibly a survey of existing papers)

And then expand to more

Google Scholar search?

No — expanded-ring search

- Read the references in the first paper
- Read the papers that cited the first paper
- Identify the faculty member in the author list, read the papers from the same group
- Read the papers/theses from the same student author

When do I stop searching?

Stop when you have read most papers cited by the paper you are going to read

OMG — that will be a lot of papers!

Three solutions

First, find out what your real passion is, and refine the topic

Second, skip papers with low citations or published in lower quality venues — let the “market” decide for you

Third, read quickly

You need all three solutions to succeed

How do I read a paper (written in English) quickly?

Read the paper in three passes

First pass: read the title and abstract

- And perhaps part of the introduction, and skim through the remainder
- It will take less than 30 minutes
- Record what you have found
- Only if the paper is found to be relevant and useful: second pass

Second pass

- Read most of the paper, but skip details that take more time to understand
- 2-3 hours, including experimental results
- Record what you have found
- Only if the paper is directly related to your work, final pass

Final pass

- Read all details in a paper, and think about the relevance to and difference from your potential new work
- As much time as you need
- Record what you have found

I said “record what you have found” three times

R Read

E Evaluate

S Synthesize

E Educate

Because it's a part of research!

→

A Act

R Record

C Create

H Heart

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Okay, I've read the paper with three passes. Now what?

Time to act!

R	Read
E	Evaluate
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Act by writing a critique about the paper you've read

In the critique, write about your own insights, not a summary of the paper

It's "pros" (advantages) and "cons" (drawbacks)

What do you like about it, and what do you think is missing or incorrect?

Include your own thoughts about the paper

- Is the system model realistic?
- What are the trade-offs made, and what are the gains achieved after making these trade-offs?
- How can research go further along this direction?

Use your own language, not copied from the paper

Now that you've acted on one paper, it's time for doing something more "research-like," and more challenging

Research by synthesizing

R	Read
E	Evaluate
S	Synthesize
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Synthesizing?

- Whenever you talk to a friend about the things several other friends have said on a movie, you engage in synthesis
- People synthesize information naturally to see the connections between things they learn

But how do we do research by synthesizing?

Research synthesis

- Synthesizing is related to but not the same as categorizing or comparing
- In addition to classifying ideas to categories or finding similarities and differences, synthesizing is a “force” of pulling them together into some kind of harmony

Let’s start from categorizing

and comparing first

Synthesizing by categorizing

- Find the common theme, objective or problem of related papers
- Categorize the papers using their differences
- Sort them in terms of maturity level

Categorizing papers

- Do the papers differ from one another in terms of —
  - Problems to be solved
  - Techniques used
  - Assumptions
  - System models

“Tracks” (“themes”) of existing works

- Once you have categorized and sorted the existing work, establish several “tracks” of work
- Understand the flow of ideas in each “track” of papers

Comparing papers in the same “track”

	Paper A	Paper B
Complexity	O(n log n)	$O(n^2)$
Scalability	Good	Poor

Then write a survey of existing papers by synthesizing

And, you are not synthesizing if you are not writing

Now we start synthesizing

- In your survey, accurately report information from existing papers using your own sentences
- Your survey is organized in such a way that readers can immediately see where the information from existing papers overlap
- Your survey helps the reader understand them with greater depth

Writing a background synthesis

- More like a "report"
- In the process of doing so, you may explore existing papers in a new way that you may have never thought of
- In the meantime you become an expert on the topic
- Only when one has reached a certain degree of expertise, is one ready to formulate a thesis

Writing a thesis-driven synthesis

- More like an argument
- You add your own insights that are original, but are derived from one or several “tracks” in the literature
  - Are the trade-offs made meaningful?
  - Do assumptions in system models weaken the validity of the claims?
  - Do experiments properly support the claims?

Okay, isn't it a waste of time? With the kind of time, I can write my own paper!

But this survey is your own paper!

All research papers are also synthesis papers, in that they combine the information you have found in ways that help readers to see the topic in a new way.

Show it to a friend or a professor to read

Ask for feedback on your survey

Then improve its quality based on feedback

And get it published!

To summarize

R Read

E Evaluate

S Synthesize

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R Read

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What about “Create”?

R Read

E Evaluate

S Synthesize

E Educate

A Act

R Record

C Create ← ?

H Heart

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Tip #1: Trust your advisor

Myths about advisors

- The myths —
  - My advisor only cares about his/her own career and promotion
  - My advisor will ask me to do lots of boring work for someone else in his/her research group
  - My advisor simply has no time for me
- Who told you these?
  - My friend in the same group said so
  - I read about them on the Internet!

Be independent when making your observations

Facts about advisors

- They all have earned a Ph.D. degree
  - which implies that they've written a Ph.D. thesis
  - which further implies that they went through training
- Their career is ultimately judged by the quality and success of their students
- They enjoy collaborating and working with students
- They know how to write a paper appropriately!

Facts about advisors

- They are busy — so they will not "hand-hold" you
- But some of their time is spent on things that are less exciting than working with students on research
- If you approach them with the temptation of good potential research, they will work with you
  - simply out of curiosity and passion for good work!

Your advisor is your best collaborator, but he/she is a scarce “resource” that others compete for as well

You need to go all out to take advantage of the "resource"

Believe it or not, he/she wishes to work with you, too!

But keep this in mind —

Your success depends entirely on you — your advisor can only help with an opportunity to do great research

It’s up to you to leverage the opportunity

Tip #2: Take interesting courses

Ideas do not grow on trees

or come from nowhere

Myths about course work

- Grades are important
- Work on papers as soon as possible and minimize the number and the variety of courses, since you need to graduate quickly — and to graduate you need papers!

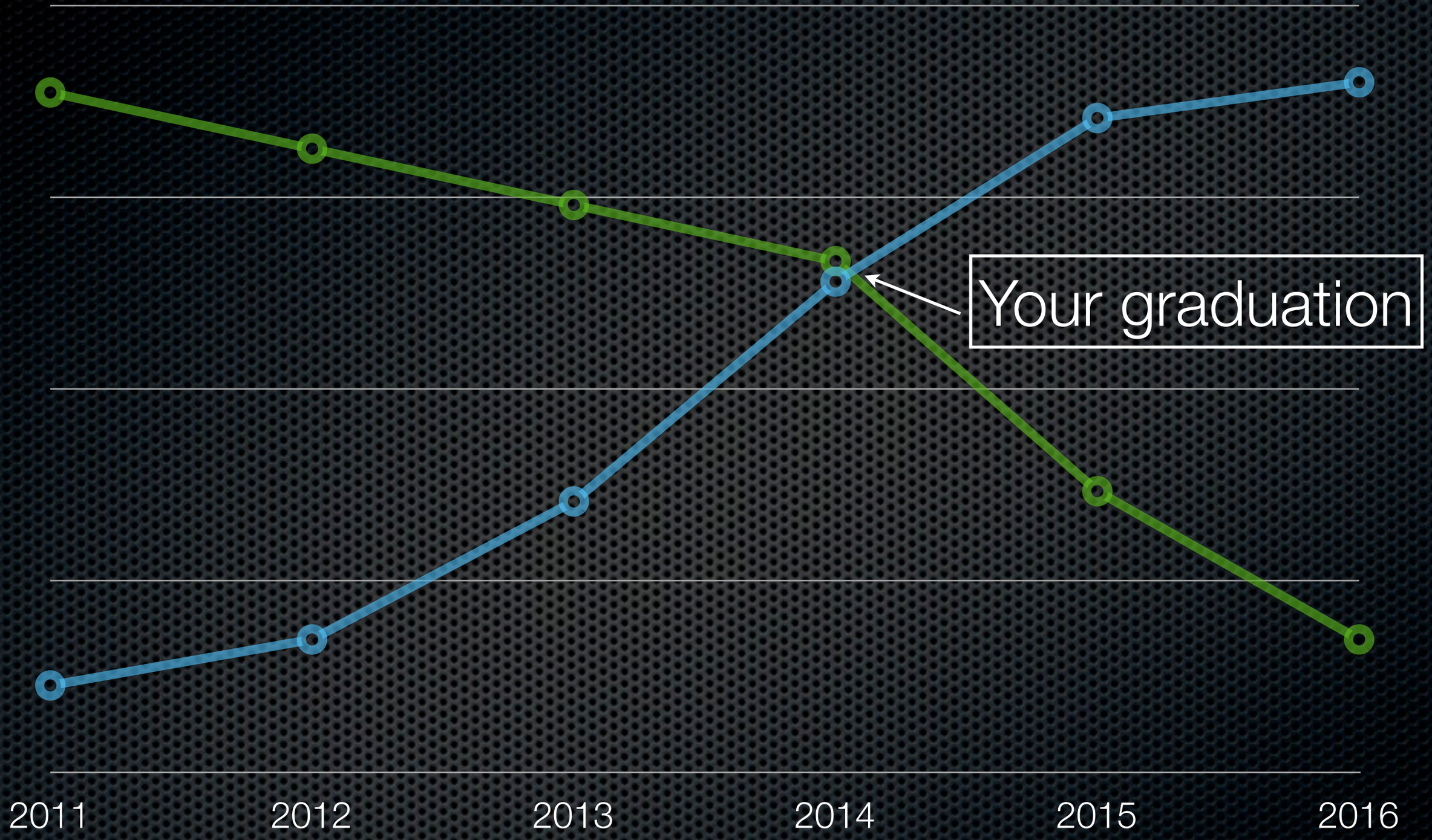
Facts about course work

- Your last chance in life to learn — take advantage of it!
- Take courses that are seemingly unrelated to research — it may help with your research ideas!

Tune in to an online course on the web (coursera, iTunes U, and others)

But I have no time — I need to graduate quickly!

Getting a Ph.D. degree is like getting married: a year or two doesn't make a big difference



- Your knowledge + Your advisor’s happiness + Your number of papers
- Inverse of your financial or family pressure

Tip #3: Communicate

Talk, talk, talk

- Talk with your advisor (and at a time and frequency chosen by you, not him/her)
- Talk with other members in the group
- Talk with people outside of your research area
- Ask questions during lectures of a course
- Ask questions during invited research seminars
- Approach the speakers of seminars afterwards, and talk

Attend a workshop or a conference

- Conferences are best venues for communicating with others outside of your workplace
- Attend technical sessions during a conference — and force yourself to ask one question after each talk
- Talk with other people during breaks, lunches, and social events
  - but not just other graduate students!
- Best opportunity to practice your English
- Don’t waste the opportunity and go sightseeing!

Educate others about your research work

- Educate your spouse or partner — tell them at a high level what you are working on
- Educate your advisor — tell him/her highlights of your ideas
  - Computer and communications are so fast-moving, it is highly likely that you know much more than your advisor ever does — on the topic you are working on
- Educate your peers — formal talks or informal discussions

R Read

E Evaluate

S Synthesize

E Educate ← Yes

A Act

R Record

C Create

H Heart

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Tip #4: Think independently, yet collaborate with others

Advice: be independent

- Independence leads to originality
- Think outside of the loop
- Do not blindly take advice from others
- Solo time is the most enjoyable time ever

Advice: real collaboration

- Do not under-estimate your own ability
- A collaborative effort makes it possible to tackle a large research project
- Your collaborators and you have complementary skills
- The quality of collaborative research may be higher
- One high-quality paper > two lower-quality papers

Tip #5: Manage your time well

Managing time well

- Time is fair to everyone, and it passes crazily fast!
- Don’t allocate too much time reading too many papers — get started with synthesizing and writing early
- Maintain a consistent pace, rather than rushing a deadline
- Say no to outside “demands” on your time

R Read

E Evaluate ← Finally!

S Synthesize

E Educate

A Act

R Record

C Create

H Heart

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Evaluating my ideas: my way

- I feel ashamed if my paper is ever proven wrong!
  - Avoid real-world implementation (sorry, no time before deadline)
  - Avoid quantitative experiments
    - If I have good intuition, who needs experiments?
    - It takes too much time to measure anything
  - Avoid comparing with benchmarks or other papers
    - I just need to compare with myself

Damn! My advisor asked me for simulations!

- Okay, I have a hunch my idea will work
- Wait, why doesn't it work in this scenario?
- Finally! I found a specific case where my idea actually works!
- Let me run a few experiments by varying some parameter values
- If my advisor is happy, I am relieved
- Now it's time to click that "submit" button and beat the deadline

Be more scientific

- Start with a hypothesis
- A sequence of experiments in different cases
- Vary one or two parameters in each experiment
- Have multiple runs in each experiment, and show variance or other statistics in results
- Prove or disprove the hypothesis

Prove your results are right

- If you can't be proven wrong, then you can't prove that you are right, either
- Compare with benchmarks or existing work
- Document all necessary details for others to reproduce your results
  - You cannot convince others if they cannot get the same results

RESEARCH

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