

# Research Methods in computer science

Spring 2020

Lecture 16

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# Agenda

Experiments and metrics

Conference Updates

Assignment

# Experiments

What experiments are useful?

Critical for the main arguments of the paper

What experiments are not useful?

Pointless experiments that generate pointless numbers, graphs, and tables

# Types of Experiments

From the “context” perspective

Controlled

Uncontrolled

There are other perspectives to be covered in future lectures

Which autonomous driving algorithm makes a car go fastest on a highway packed with rush hour traffic?

Experiments?

Metrics?

Does allowing the students to do  
Chemistry Labs in Virtual Reality improve  
their chemistry grade?

Experiments?

Metrics?

# Paper Expectations

Readers and reviewers set expectations

What are they?

Fair and unfair expectations.

# Claims

Is the claim articulated clearly?

Is the claim specific enough?



# Evidence

Is there evidence supporting the claim?

Is the evidence credible?

Often just from the title,  
we set expectations for the paper.

It can be positive:  
efficiency in reading and reviewing

Lets discuss expectations  
for the following paper ideas

A new algorithm that translates English text to Spanish.

A new wireless networking technology.

A new algorithm that can identify the person in an image.

A new type of user manual to assemble  
furniture at home.

# Generating Research Ideas

“Standing on the shoulders of giants”

Most ideas may not be new

New may be subjective

Adding a layer to an existing deep learning architecture

When is it new?

When is it not new?



# Idea Generator Heuristics

## Combination / Hybrid techniques

From the same discipline

(e.g., ....)

From a different discipline

(e.g., ....)

## Address Gap/limitation (Incremental?)

Handle some cases that were not handled

Improve some (partial) aspects of dimension

Apply different datasets / settings / contexts

# HW7

## Idea Generation

Pick an important paper in your area of research.

Consider three different ways to generate research based on the paper you picked and generate one idea per technique.

Explain the heuristics and demonstrate how you use the heuristics to create a new ideas.