

# Research Methods in computer science

Fall 2021

Lecture 12

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# Agenda

Conference Organization

Metrics/Experiments

Paper Introduction

HW6

# Conference Organization

## Different roles

General Chair

Finance Chair

Arrangement Chair

Technology Chair

Program Chair

Publication Chair

Technical Program Committee

Many other roles

## Schedule for activities

# Technical Program Committee

Review papers

Types of discussions and meetings

We formed the organization and technical program committee for the conference. We also decided tentative schedule for the conference.

# Metric

Why do we want to measure?

What to measure?

# Metrics/Experiments?

Accurately Initializing Real Time Clocks to Provide Synchronized Time in Sensor Networks

CTP: An Efficient, Robust, and Reliable Collection Tree Protocol for Wireless Sensor Networks

On the Effectiveness of Energy Metering on Every Node

Surviving Sensor Network Software Faults

# Metrics from Classification Research

Classification Accuracy

Logarithmic Loss

Area Under ROC Curve

Confusion Matrix

Classification Report

Precision

Recall

F1-Score

Partly from <https://machinelearningmastery.com/metrics-evaluate-machine-learning-algorithms-python/>



# Metrics from Regression Research

Mean Absolute Error

Mean Squared Error

$R^2$

Partly from <https://machinelearningmastery.com/metrics-evaluate-machine-learning-algorithms-python/>

# Metrics from Systems Research

Reliability

Latency

Coverage

Energy

# 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

# Group Activity

Experiment Design

Metric Selection

# Group 1

A new algorithm that translates English text to Spanish.

# Group 2

A new wireless networking technology.

# Group 3

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



# Paper Introduction

What is the problem?

Why is it interesting and important?

Why is it hard? (E.g., why do naive approaches fail?)

Why hasn't it been solved before? (Or, what's wrong with previous proposed solutions? How does mine differ?)

What are the key components of my approach and results? Also include any specific limitations.

Summary of results and contributions.

# HW6

## Introduction

Consider the questions we discussed

## Related Work

Build on what you have already done in HW3