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