Research Methods
in computer science
Spring 2019

Lecture 15

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Agenda

Conference Organization
Experiments and metrics
Reading Papers
HW7
Metric

Why do we want to measure?

What to measure?
Most of the time we measure improvements
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
Group Activity

Experiment Design
Metric Selection
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
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.
Write a draft Introduction and Related Work for your paper. It should be about 2 pages in length. Use the template to be used in the conference.