

CS 451 / 551 / ECE 541

ADVANCED
COMPUTER ARCHITECTURE

SESSION no. 19

SCIENTIFIC PAPER

- DESCRIBES RESEARCH EFFORT
- ~~ABSTRACT~~ ABSTRACT OR SUMMARY
- SIGNIFICANCE - WHY IS THIS IMPORTANT?
- BACKGROUND - LEAD TO THIS WORK
- HYPOTHESIS PROVE OR DISPROVE

1. THEORY - MATHEMATICAL PROOF
FORMAL LOGIC

2. QUOTE RELIABLE SOURCES

3. EXPERIMENT

GENERAL CONCLUSIONS -
STATISTICALLY SIGNIFICANT
SAMPLE.

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PLAGIARISM - USING SOMEONE'S WORK
WITHOUT CREDIT!
NOT ALLOWED!

ARCHIVAL -
· THESIS OR DISSERTATION

· JOURNAL ARTICLE

STORY

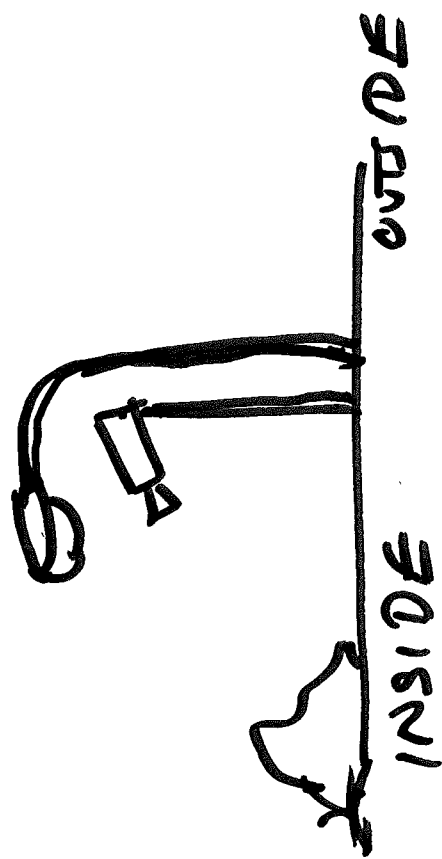
1ST JOB - EMBEDDED COMPUTING FOR
SEISMIC EVENT DETECTION

2ND JOB - AFFORDABLE NIGHT VISION

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NUCLEAR STORAGE AREA SECURITY

INTRUSION DETECTION



PROPOSED: THERMAL IR

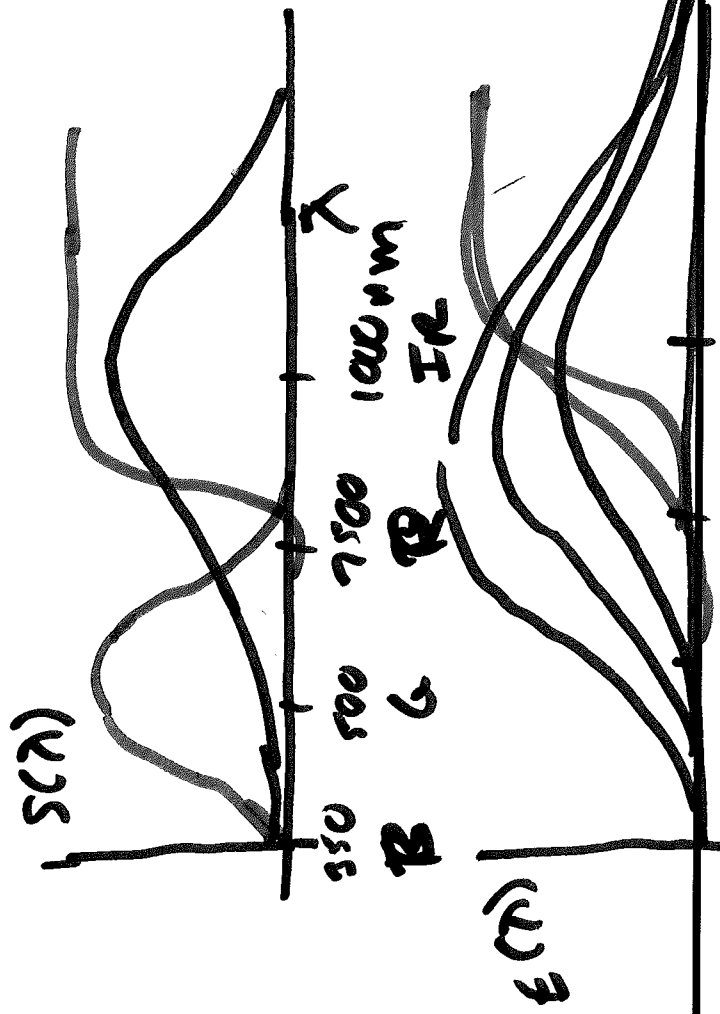
• CRYOGENIC COOLING

• 810°

• Incandescent
bulb

• Run 'cold'

220V → 110V
← PAINT



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NO BACKGROUND IN THIS!

- DEPEND ON PUBLISHED LITERATURE
- ASTROPHYSICAL JOURNAL - 1916
- DID AUTHORS KNOW WHAT IT WOULD BE USED FOR?
- NO - WROTE FOR PERMANENCE

IMPORTANCE OF WRITING

- EARLY CAREER - TECHNICAL SKILL
- LATER - COMMUNICATION BECOMES DOMINANT SKILL
 - TEAMWORK
 - SALES PITCH
 - INSTRUCTION / DIRECTING

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STORY

AFRL - DARPA

↳ DEFENSE ADV. RESEARCH
PROJECTS AGENCY

↳ AIR FORCE RESEARCH LAB (SPACE)

MAJOR REASON FOR NOT FUNDING A
PROPOSAL:

1. DON'T UNDERSTAND WHAT PROPOSERS
PLAN TO DO.
2. POOR ORGANIZATION

TLDR

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PROFESSIONAL WRITING STYLE

TEAM PAPER

COLLEAGUE-TO-COLLEAGUE

- SOMETHING WE'RE BOTH INTERESTED IN
- RESEARCH IT - COMMUNICATE IT TO ME,

REFERENCES

N 10

- WEB REFERENCES O.K.

- NOT FOR ARCHIVAL (THESIS)

• FIND ~~REFERENCE~~ A PERMANENT

REFERENCE: NAME, ID.

XIUNX: FIXED POINT ARITHMETIC ON FPGA'S

AN 42223-12

Professional Writing Style

Greg Donohoe

Revised: 5 November 2013

Professional communication should be direct and simple, as if you were explaining the work to a colleague. Say what you mean, mean what you say, and be concise.

Guiding principle: "Don't make me think!"

A technical report must be persuasive as well as informative

- Persuade the reader that the work is important and worth continued support

Effective communication flows easily

- Tell a little story – A leads to B, and to C, and inevitably to D (our solution)
- Make it easy on the reader: eliminate clutter.

Cluttered: "Of the kinds of fasteners that we could have used, instead of screws or nails, we chose tacks made of brass to hold the lid on because they don't rust."

Cleaner: "We fastened the lid with rust-proof brass tacks."

Get to the point right away – don't build up to it with a lot of background, or you'll lose your reader.

Avoid repetition (redundancy). It interrupts the flow. Well-structure writing doesn't need it.

State the facts – don't embellish or use hyperbole (intentional exaggeration)

Exaggeration: "We had to wait forever for the results."

Fact: "We received the results in three weeks, which was two weeks later than promised."

Hyperbole: "The results of the experiment were incredible."

What does *incredible* mean? It's the opposite of *credible*!

Fact: "The results of the experiment exceeded expectations. We expected to generate 7 volts, but in fact measured 10.3 to 11.5 volts."

Use neutral, non-judgmental language. In the example above, I was going to label examples "Bad", "Better", "Bad", and "Good", but decided to label them "Exaggeration", "Hyperbole", and "Fact". Why is judgmental language not advised?

1. It's ambiguous. Not everyone agrees on what "good" and "bad" mean. Everybody knows the difference between 7 volts and 10.3 volts.
2. Judgmental language can be inflammatory, provoking hostility or defiance in the reader.

Avoid brand names when you are referring to something more general.

Not: "The fat end of the chord is plugged into Avista."

But: "The fat end of the chord is plugged into a source of 110V AC line voltage."

2

Flow

Don't refer to something before you have defined it or described it.

Acronyms: define them on first use e.g. Field Programmable Gate Array (FPGA). Afterwards, you can just say FPGA.

Use good grammar. It makes your writing so much clearer.

Reference: *The Elements of Style*, Wm. Strunk and E.B. White, New York: Longman, 2000.

Documenting Projects

Teamwork: agree on terminology, and everybody stick to it

- Names of things
- Modules, signals, variables