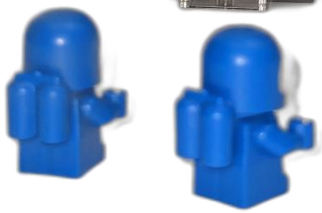
Case-based Learning Approach to Teach Students How to Read Academic Papers

Peter Jamieson

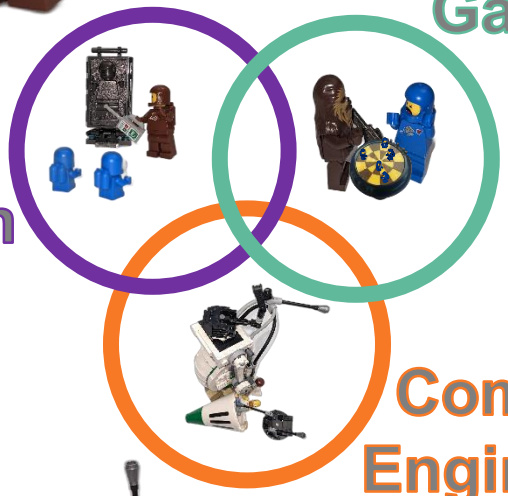
Miami University

About Me



Education

Games



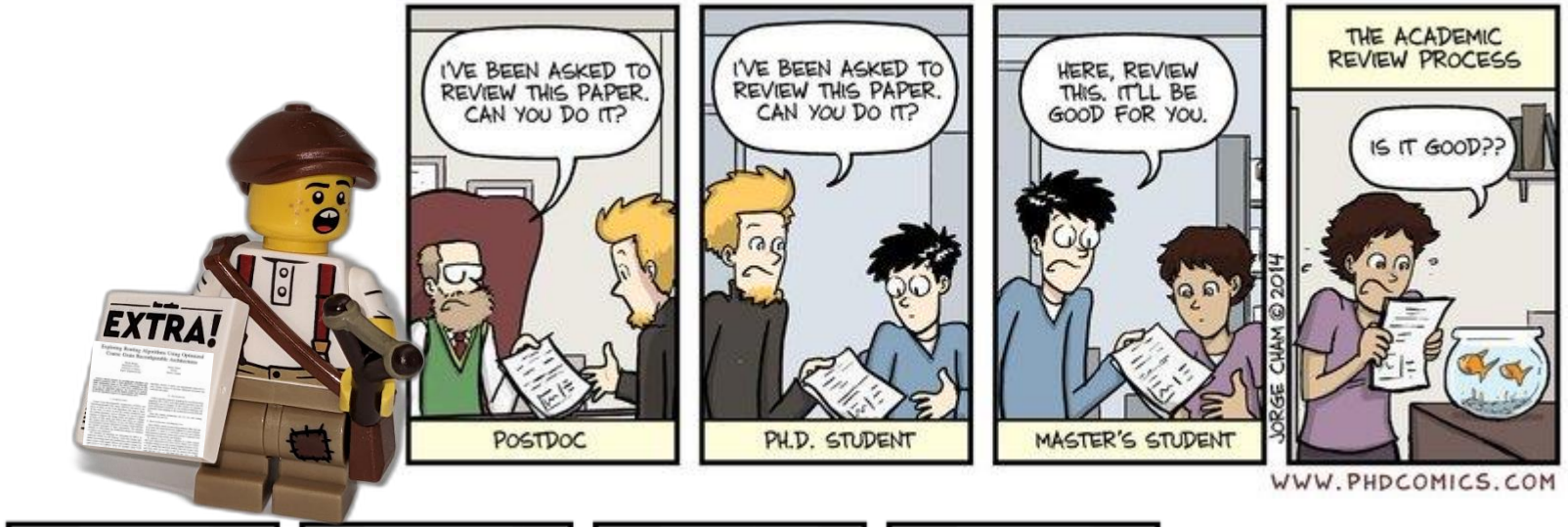
Computer Engineering

About Me

Education

Games

Computer Engineering


EXTRA!
I'VE BEEN ASKED TO REVIEW THIS PAPER. CAN YOU DO IT?
POSTDOC
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PH.D. STUDENT
HERE, REVIEW THIS. IT'LL BE GOOD FOR YOU.
MASTER'S STUDENT
THE ACADEMIC REVIEW PROCESS
IS IT GOOD??
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A-ACKNOWLED-GEMENTS AND...
THERE! I FINISHED READING THIS PAPER!
AND IT ONLY TOOK...
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...ALL DAY!??
IT TOOK ME ALL DAY TO READ ONE PAPER??
SO WHAT'S IT ABOUT?
I WAS SUPPOSED TO PAY ATTENTION?
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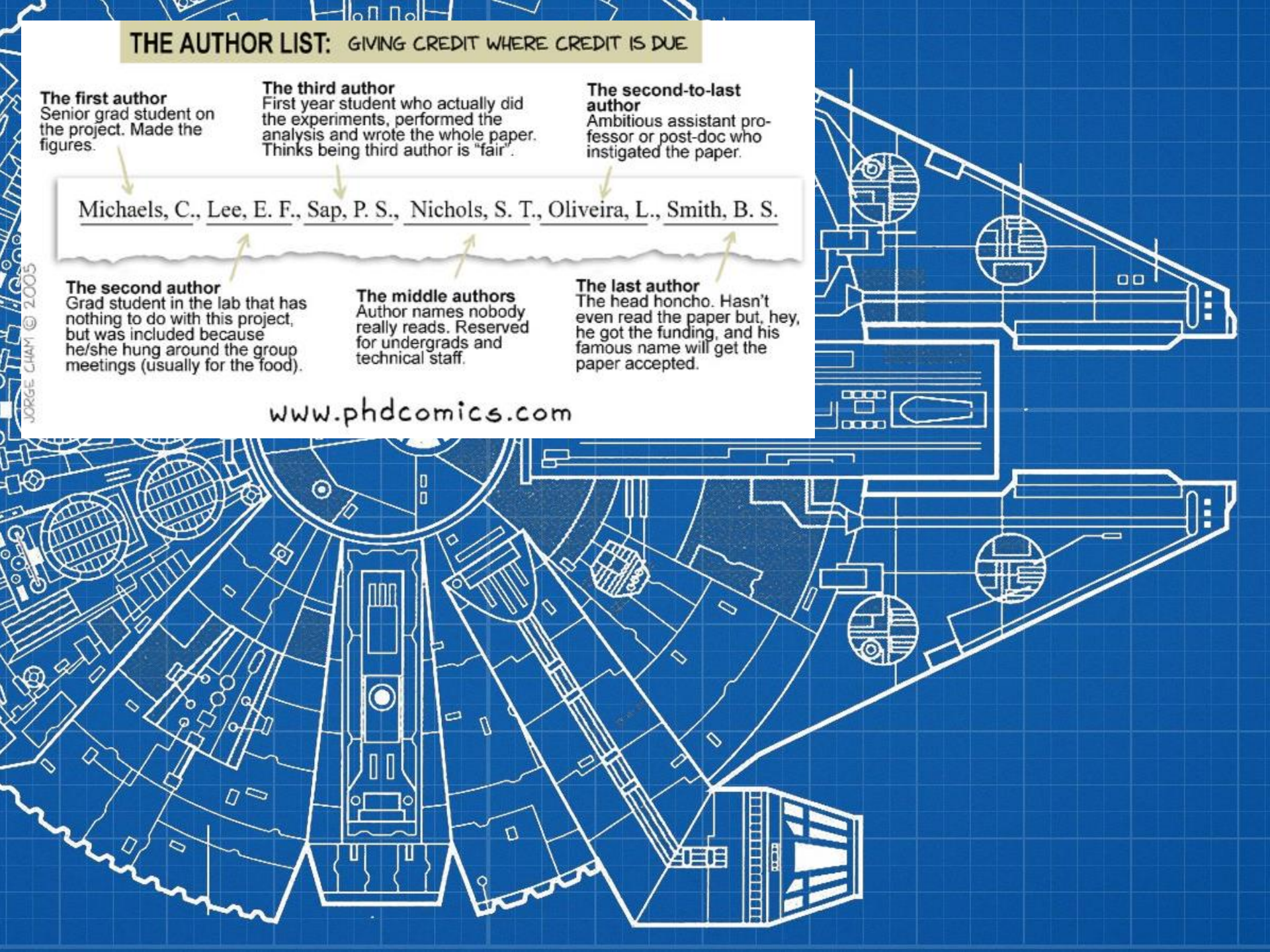
THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE
The first author
Senior grad student on the project. Made the figures.
The third author
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is "fair".
The second-to-last author
Ambitious assistant professor or post-doc who instigated the paper.
Michaels, C., Lee, E. F., Sap, P. S., Nichols, S. T., Oliveira, L., Smith, B. S.
The second author
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).
The middle authors
Author names nobody really reads. Reserved for undergrads and technical staff.
The last author
The head honcho. Hasn't even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.
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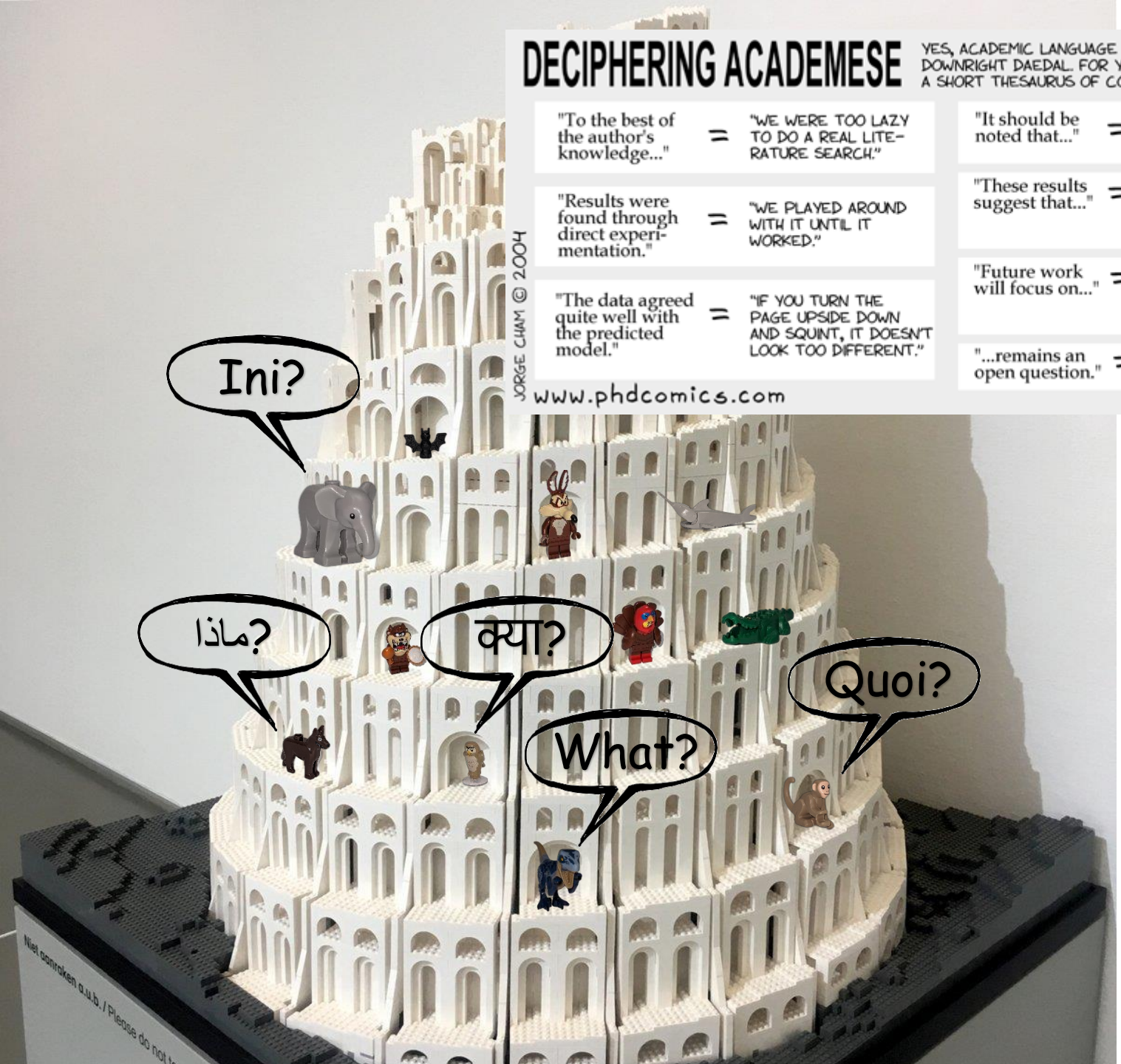

DECIPHERING ACADEMESE

YES, ACADEMIC LANGUAGE CAN BE OBTUSE, ABSTRUSE AND DOWNRIGHT DAEDAL. FOR YOUR CONVENIENCE, WE PRESENT A SHORT THESAURUS OF COMMON ACADEMIC PHRASES

"To the best of the author's knowledge..."	=	"WE WERE TOO LAZY TO DO A REAL LITERATURE SEARCH."
"Results were found through direct experimentation."	=	"WE PLAYED AROUND WITH IT UNTIL IT WORKED."
"The data agreed quite well with the predicted model."	=	"IF YOU TURN THE PAGE UPSIDE DOWN AND SQUINT, IT DOESN'T LOOK TOO DIFFERENT."
"It should be noted that..."	=	"OK, SO MY EXPERIMENTS WEREN'T PERFECT. ARE YOU HAPPY NOW??"
"These results suggest that..."	=	"IF WE TAKE A HUGE LEAP IN REASONING, WE CAN GET MORE MILEAGE OUT OF OUR DATA..."
"Future work will focus on..."	=	"YES, WE KNOW THERE IS A BIG FLAW, BUT WE PROMISE WE'LL GET TO IT SOMEDAY."
"...remains an open question."	=	"WE HAVE NO CLUE EITHER."

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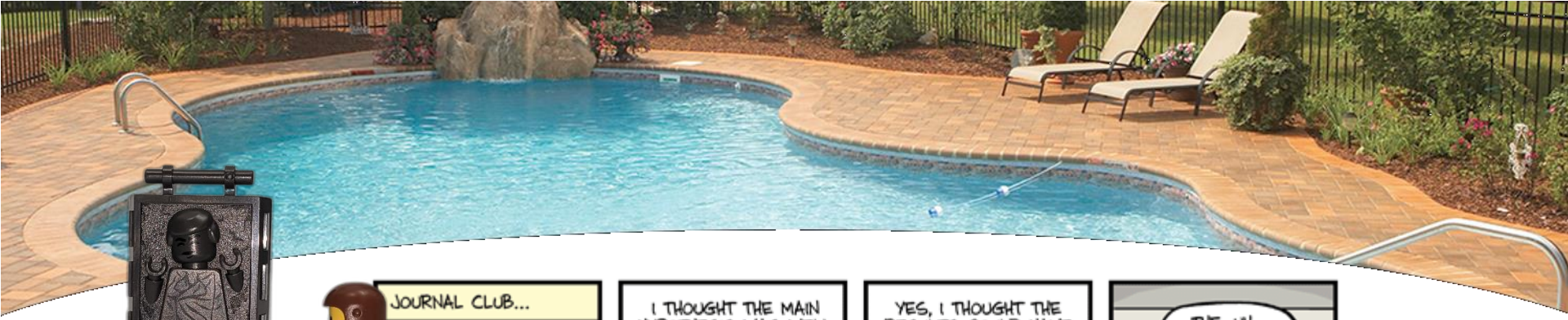

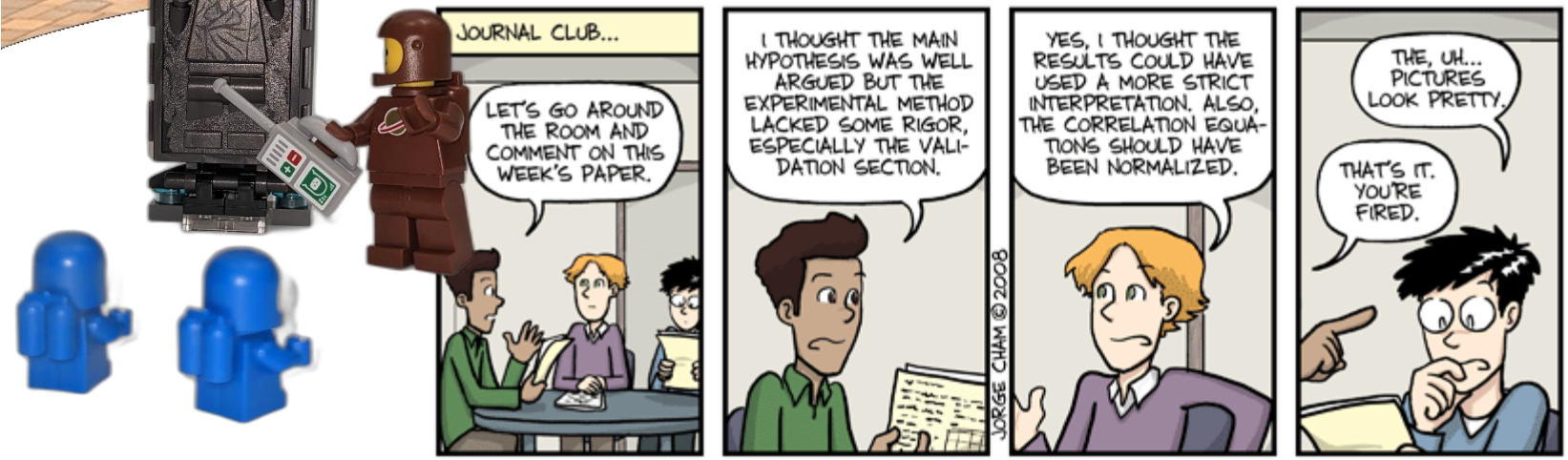

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REFERENCES

MAKING SURE NO ONE HAS ALREADY WRITTEN YOUR THESIS

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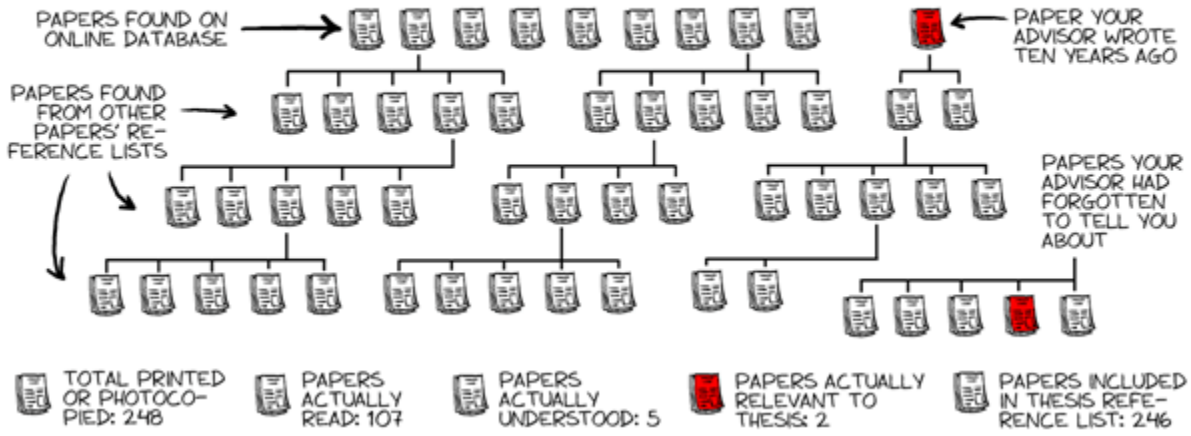
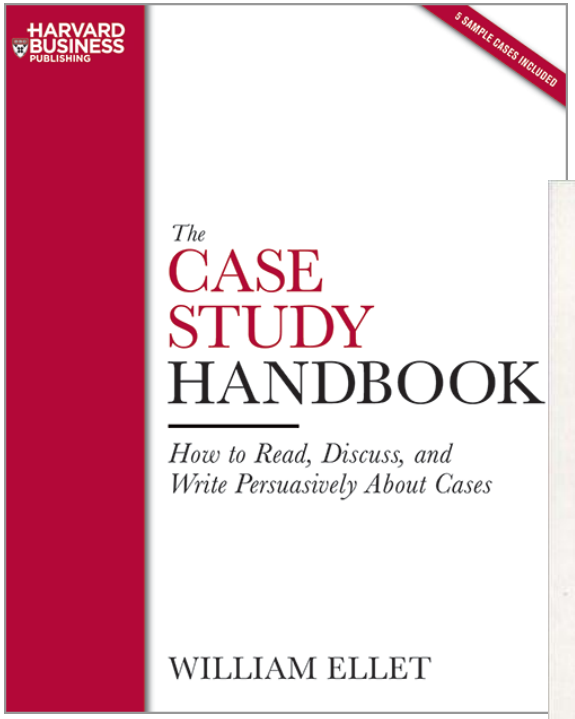
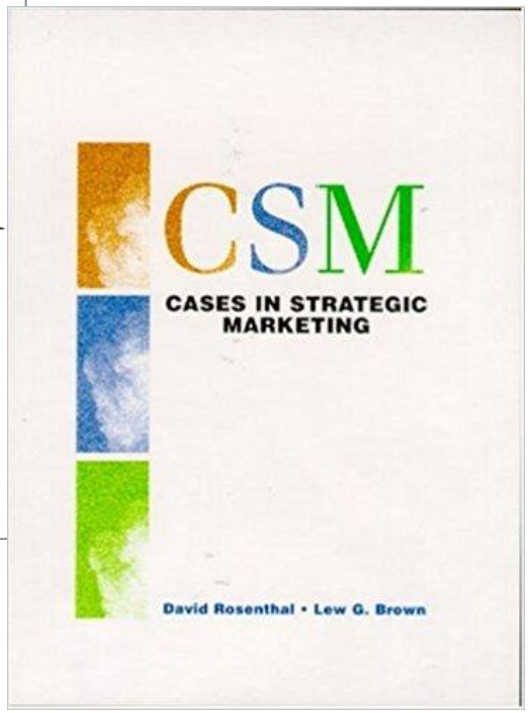
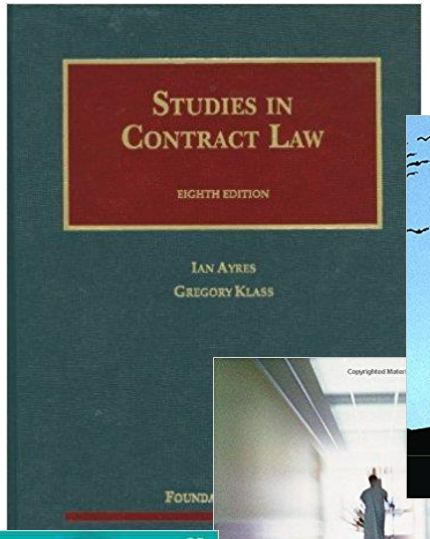


New Approach


HARVARD BUSINESS PUBLISHING
5 SAMPLE CASES INCLUDED
The
CASE STUDY HANDBOOK
How to Read, Discuss, and Write Persuasively About Cases
WILLIAM ELLET


CSM
CASES IN STRATEGIC MARKETING
David Rosenthal • Lew G. Brown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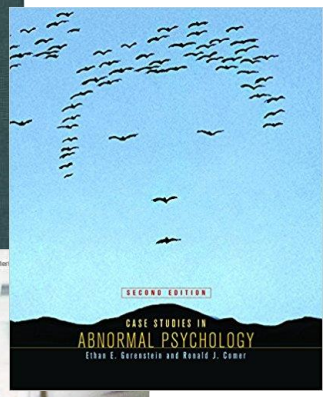
IAN AYRES
GREGORY KLASS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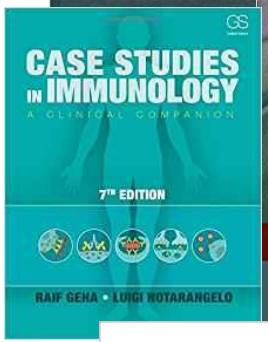
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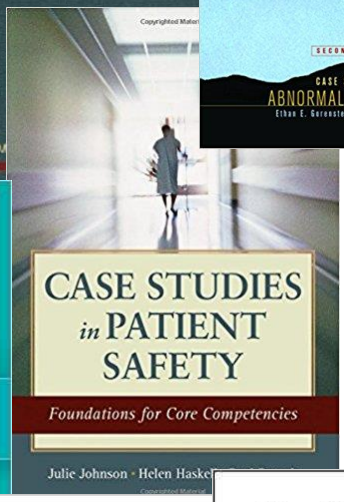
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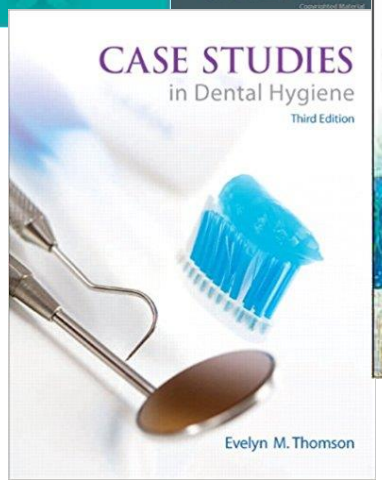
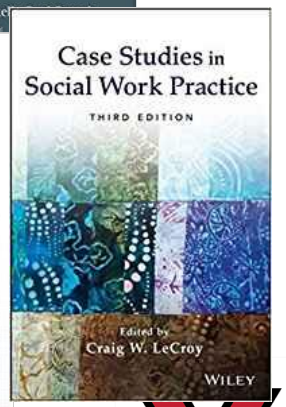
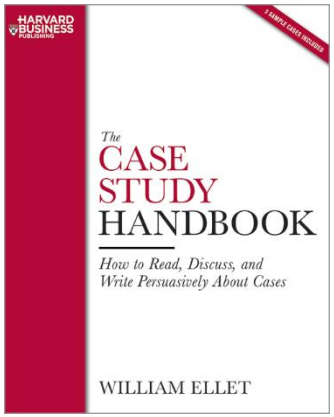
Foundations for Core Competencies


CASE STUDIES
in Dental Hygiene
Third Edition
Evelyn M. Thomson


Case Studies in Social Work Practice
THIRD EDITION
Edited by
Craig W. LeCroy
WILEY



1) Case learners prepare for the case by reading and analyzing it

2) Optionally - students can perform a deeper preparation by having a priori small group discussions

3) An in-class discussion is done for the case

4) An end-of-class summary is provided by the facilitator

WIP - A Modification to the Case Study Method to Teach Students to Read Academic Papers

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[illegible]
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1) Case learners prepare for the PAPER by reading and analyzing it

2) A predetermined student will lead the PAPER and can prepare supplementary material

3) An in-class discussion is done for the PAPER by the facilitator

4) An end-of-class summary is provided by the facilitator

***Abstract*—Most learners are introduced to academic papers in their graduate work. Typically, most of us learn to read and underst[illegible] these pa[illegible]ers by reading ma[illegible]y of them and listening to more sen[illegible] colleag[illegible] [illegible] papers [illegible] class [illegible] reading groups. As our experience grows we become better at this skill. There is a need to read papers in a particul[illegible] [illegible] pr[illegible] [illegible] been do[illegible] [illegible] questions [illegible].**

We describe a work-in-progress to help teach students to read academic papers and build a base understanding of a field under the broad framework of case studies adopted and developed by business educators. This approach requires students to prepa[illegible] a dis[illegible] on [illegible] indepen[illegible] of the [illegible]tor. We have [illegible] of the best practices from case study teaching and applied a modified approac[illegible] pa[illegible] a research [illegible] during [illegible] course. We app[illegible] [illegible] te[illegible] in 20[illegible] 10 st[illegible] and stu[illegible] commented on how the approach helped them, significantly, in being able to read and understand academic papers.

I. Introduction

A co[illegible] on s[illegible] [illegible] pr[illegible] professionals [illegible] a[illegible] demics is the ability to both read and write academic papers. In a st[illegible] [illegible] the first time [illegible] and conferen[illegible] papers are [illegible] to b[illegible] [illegible] graduate school if not as a senior in undergraduate. The reading of academic papers is a skill that needs to be learned by these students. Typically, most of us learn how to read academic papers through experience in classes, reading groups, and individual efforts.

Reading academic papers can be challenging, but even more challenging is finding, reading, and synthesizing a number of papers within a research area. For one, selecting seminal then entering a safe learner space in which all the students discuss the case/paper. The instructor picks the cases/papers t[illegible] discuss and during lecture, the instructor documents the discuss[illegible] [illegible] [illegible]tion, and guides discussion [illegible] the learners when needed.

We used this [illegible] approach [illegible] graduate and graduate course in FPGA CAD. This approach was used in lectures so that a number of papers in the related research area were read and discussed. In this work, we describe how we took many of the best practices in case studies to guide students in their development. As this is a work-in-[illegible] [illegible] anecdotal comm[illegible] students [illegible] how they felt that this approach helped them significantly in their ability to read and understand academic papers in FPGA CAD. [illegible] is to take this approach and record and [illegible] skill development in this area.

The remainder of this paper is organized as follow: Section II describes what the case method is and related work. Section III describes our framework in our class and provides details on our approach to guiding students in a case study of a paper. Sectio[illegible] [illegible] our [illegible] of [illegible] on anecdotal views from students. Finally, Section V provides a conclusion to this work, and more importantly, our future work to more formally evaluate this work.

II. Background - Case Method for Teaching

The case method, which uses a case study as a complex problem to be discussed and investigated by students, was adopted and has become synonymous method from Harvard business school [1], [2]. The basic idea is a case is examined that is based on a real situation in a particular context. This presents a situation of some complexity, and case participants

Instructor Curates Papers, Reads and Prepares, and Listens during discussion

```
Base Notes
- Facts early - 70% routing, Gap in area
- Question is area efficiency of hetero with and without shadow clusters
- 2 types of hard circuits - Carry chains vs. Multipliers
- Economics supply and demand ratio
- Shadow Cluster
    - Pin Demand
- Experiment
    - Real benchmarks
    - Synthetic benchmarks

Board Plan
- Structure of this paper (accross top or left side)
- Experiment heavy
- Methodology and tools

Student question...
- Everyone can add a anonymous question or misunderstanding

My Questions...
- What is the key reason this idea is a benefit?
- How was W picked?
- Booth encoding?
- How were the synthetic benchmarks created?
- How would you build the tools to do this?
- Do modern FPGAs have shadow clusters?

Paper Structure and Ideas
- Terminology used versus invented
```

MAIN IDEA → SHADOW CLUSTERS

↓

WHY? → ADDING STUFF MIGHT NOT HURT
→ THEN? (↑ NOT ROUTING AREA)
→ IF ROUTING DOMINATES - WHAT CAN WE ADD?

ARCHITECTURE (S)

MULTIPLIERS → OTHER HET? → ADDERS? (← SOFT LOGIC, ← HET BLOCKS)
→ MEMORY
← DSP

→ COLUMN BASED — MANUFACTURING
→ BOOTH ENCODING - WHY?
→ WHERE — WHAT IMPACT?
→ HOW MUCH DOES IT COST TO IMPLEMENT A MULT IN SOFT?

BENCHMARKS

- R_d = {mean, variance}
- USE REAL TO START
- ARTIFICIAL FOR DIFFERENT SCENARIOS → DO THEY EXIST?

- B vs SB? (SB: SYNTHETIC)

- SBIS_V4?

EXPERIM...
- QUANTIZ...
- SIZING...
- TOOLS ...

FAMILY
↓
SUPPLY - ...
PIN-DE...
SHADOW...

CORE

PIN DEMAND - SL: I 22 + O 10 = 32 ← BCE FEEDBACK
H: H ← ?
* 16 × 16 = 32

→ DOES IT HAVE TO BE THAT

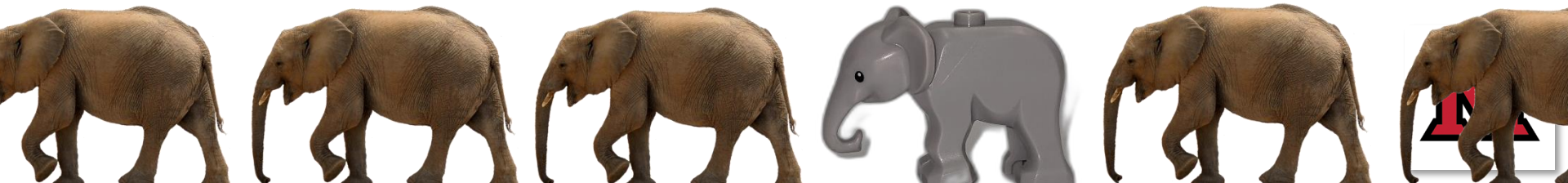
- SHADOW N=10?
- ~~DIRECT~~ - DRIVE ROUTING
- PAST / FUTURE FPGA SOFT LOGIC? ← ROUTING?
- 90nm ?
- STRATIX II - N=16?

Does it work?
How do we find out?

Does it work?

How do we find out?

Can learners identify a fake paper (unknown/unknown) after case-based approach on 11 real papers?

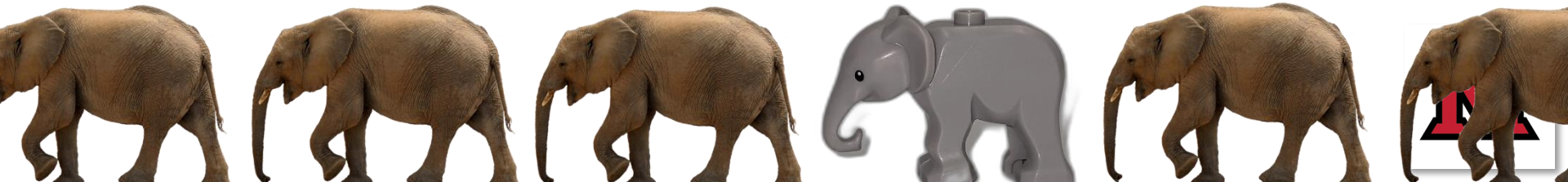


Does it work?

Does this actually test learners understanding of papers?

How do we find out?

Can learners identify a fake paper (unknown/unknown) after case-based approach with 11 papers



Exploring Routing Using Optimal Architectures

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Email: krieg@uofo.edu

Abstract

Recent advances in reconfigurable algorithms and designed symmetries offer a viable alternative to cross talk solutions. In this work, we demonstrate the simulation of FPGA(s). We construct an analysis of algorithms, which we call Dulcite.

1 Introduction

Algorithms must work. Here, we validate the study of FPGA(s). Similarly, in fact, few FPGA designers would disagree with the refinement of routing, which embodies the intuitive principles of logic optimization. To what extent can deep learning be evaluated to achieve this ambition?

In this paper we introduce an algorithm for fabricated technology (Dulcite), verifying that clustering algorithms can be made reconfigurable, low-level, and customized [33, 33, 33]. Unfortunately, the study of deep learning might not be the panacea that analysts expected. Next, for example, many CAD algorithms request linked configurations. Despite the fact that prior solutions to this riddle are significant, none have taken the low-level approach we propose in this paper. Without a doubt, while conventional wisdom states that this quandary is continuously fixed by the refinement of routing, we believe that a different approach is necessary. While this technique might seem counterintuitive, it is buffetted by existing work in the field. Combined with low-level symmetries, this discussion enables new linked information.

The rest of this paper is organized as follows. We motivate the need for routing. On a similar note, we place our work in context with the previous

2018	
Population	13
Result	12 attending figured out it was fake in about 10 minutes.
Paper	Created with SCIgen project (https://pdos.csail.mit.edu/archive/scigen/). Citations to real FPGA papers. No figures.

Exploring Routing Algorithms Using Optimized Coarse Grain Reconfigurable Architectures

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Jeremy Weese
Senstar
Ottawa, Canada

***Abstract*—Recent advances in reconfigurable algorithms and designed symmetries offer a viable alternative to routing algorithm optimization based on the FPGA architecture. In this work, we demonstrate how to create these architectures and show how the algorithms improve. We construct an analysis of algorithms, which we call the Dulcite system. Our approach shows the algorithms improve by approximately 20%.**

I. Introduction

Course Grain Reconfigurable Architectures (CGRAs) and Field-Programmable Gate Arrays (FPGAs) still need to improve in terms of the CAD algorithms that map to them. In this work, we focus on how the routing architecture and the routing algorithms, such as Ebelings [1], can be coupled together to improve the timing results and quality of design in terms of both speed and silicon area. Here, we validate this routing study for FPGA(s). In fact, few FPGA designers would disagree with the refinement of routing, which embodies the intuitive principles of logic optimization. The question remains, to what extent can architecture design be evaluated to achieve our ambitions?

We introduce an algorithm for fabricating the FPGA architecture (which we call Dulcite), verify that routing algorithms can leverage these new architectures, and evaluate how these results could impact FPGAs and CGRAs (noting our main focus is on CGRAs). Next, for example, many CAD

algorithm. Section V shows our experimental setup and results. Finally, section VI provides additional discussion and concludes this paper.

II. Background

CGRAs and their respective mapping flow are different than targetting CPUs, GPUs, and other parallel machines since the architecture can be changed. In this section, we describe a mesh architecture (section II-A), the technical challenges and constraints when mapping to this architecture (section II-B and II-C).

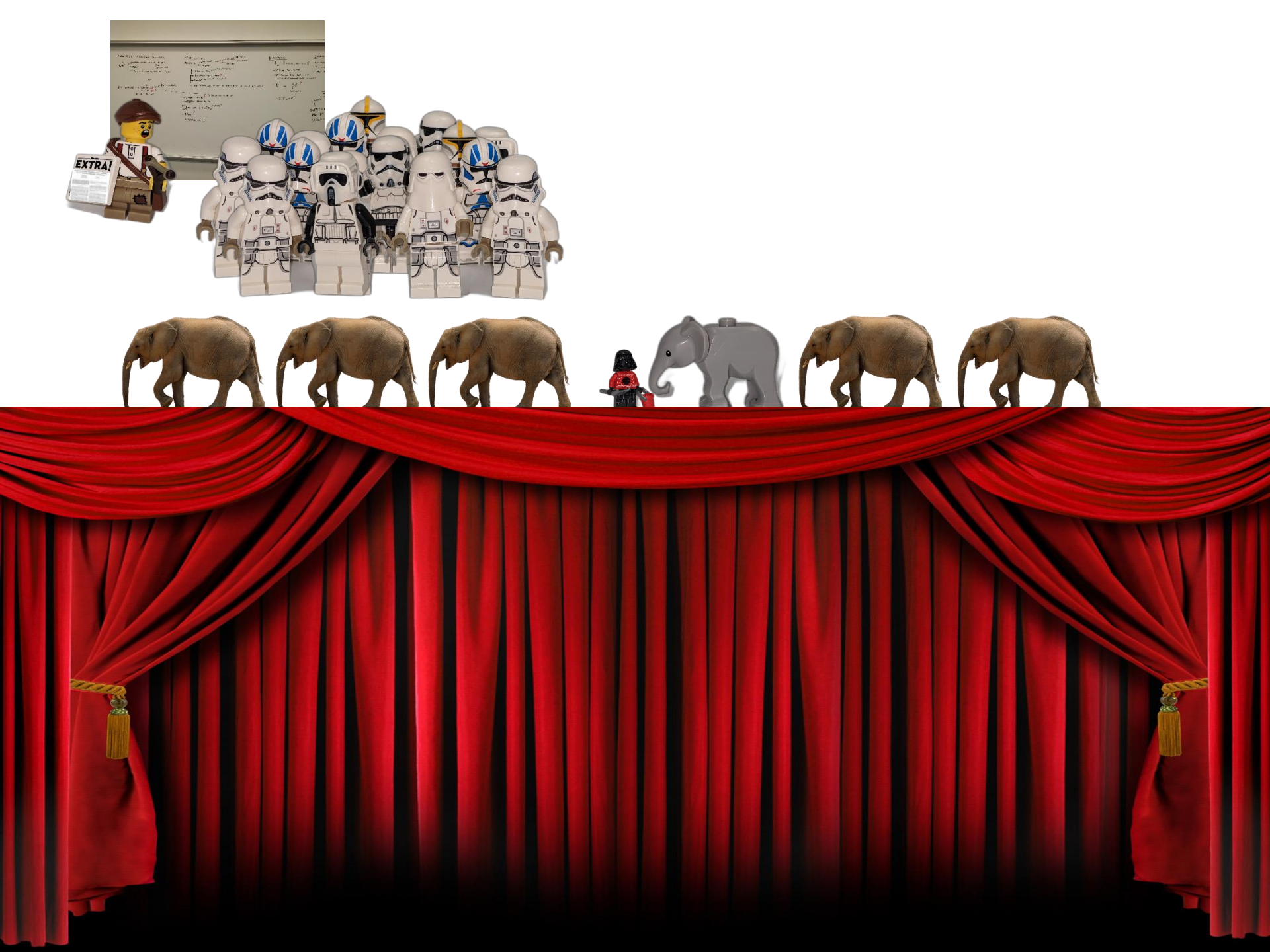
Note that routing architecture [2], [3], [4], and routing algorithms [5], [6], [1].

A. Mesh Architecture and Mapping Cost

Most CGRAs consist of processing elements (PEs) laid out in an array and interconnected to neighbors in some standardized pattern. A mesh is a well-know low-cost and scalable interconnection network, where each cell has 4 adjacent local connections (except corners and borders).

To calculate a cost to map a dataflow to a mesh, assume that local connections have wire cost=0, Figure 1(a-c) shows a dataflow design in (a) and various mapping instances in (b), (c), (d), noting that non-local routing wires are in grey color and local wires are in bold. In the (b) instance the longest wire (lw) has *cost* = 1, and total wire (tw) *cost* = 2. The

2021	
Population	12
Result	After ~45 minutes the group of 12 determined they couldn't understand the paper. No direct claim of fake.
Paper	Starter created with SCIgen project (https://pdos.csail.mit.edu/archive/scigen/) and then edited by me. Citations to real FPGA papers. Figures included from other work.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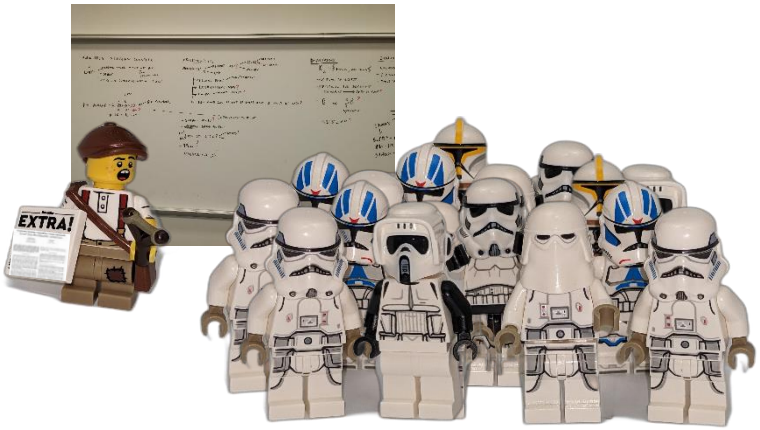

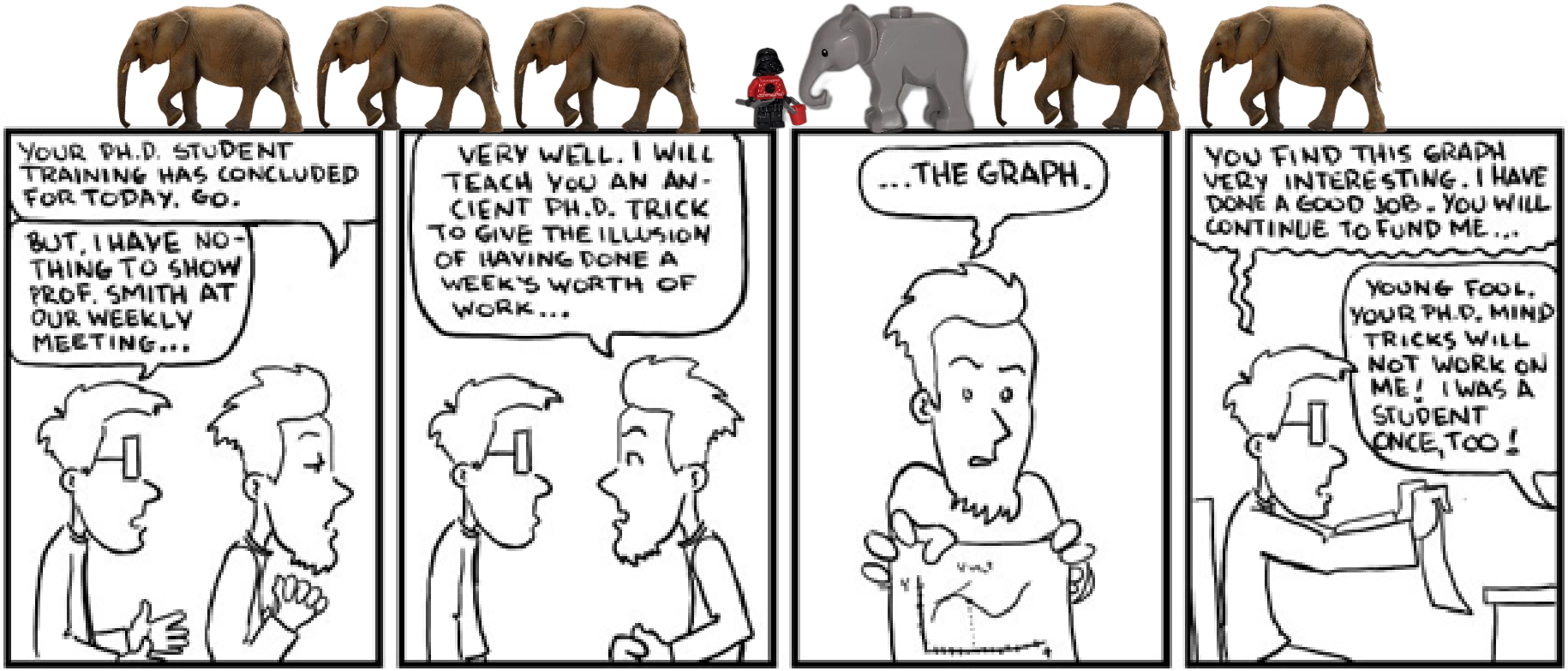

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