Weak accept

or: how I learned to write papers and deal with reviews

Alex Kavvos

University of Bristol

Logic Mentoring Workshop 2024, Tallinn, Estonia, 7 July 2024

Writing

- Writing is hard…
- …but it is also the **main form of scientific communication**.
- You must learn how to do it well!
- Everybody does it differently…

Writing

- Writing is hard…
- …but it is also the **main form of scientific communication**.
- You must learn how to do it well!
- Everybody does it differently…
  - “The first draft of anything is shit.”
    — Ernest Hemingway

Writing

- Writing is hard…
- …but it is also the **main form of scientific communication**.
- You must learn how to do it well!
- Everybody does it differently…
  - “The first draft of anything is shit.”
    — Ernest Hemingway
  - “I also know why that equipment [word processors] is so time consuming to use: it is so easy to make a change in your text. It is an open invitation to write first, and to correct and improve later. I know that some schools of English composition even promote that form of iterative design as the one and only viable paradigm for writing. But I think that that is very short-sighted because in the longer run it is much more effective to train oneself to get one’s text almost always right the first time.”
    — Edsger Dijkstra (EWD978)

An Assortment of Tips

- **The introduction is the most important bit.**
- **Explicitly state what you claim your contribution to be.**
- **Know your audience**. To which community are you speaking? Rule of thumb: write to yourself before you started this project.
- **Be defensive!** Think like a reviewer; answer before they ask.
- **Stand on the shoulders of giants.** Cite 'standard' sources.
- **There must be something for everyone.** (undergrad; PhD student; newcomer; experienced researcher; top world expert)
- **Have rôle models. Determine why you like their writing.** (mine: Samson Abramsky, Dana Scott, J-Y Girard, Steve Awodey)
- **Write short paragraphs.** E.g. NYT, Washington Post, BBC.
- **Avoid the passive voice.** Use the first person (even singular).
- **Context is cheap, so always try to establish it.**

Context is cheap

Mark Rutte Moves From Leading Netherlands to Heading NATO.
By Steven Erlanger. 26 June 2024[1]
Mr. Rutte, who served as the Dutch prime minister for nearly 14 years, has been a harsh critic of Russia's president, Vladimir V. Putin, and a strong supporter of Ukraine.

Mark Rutte, the long-serving Dutch prime minister, was formally named the new secretary general of NATO on Wednesday, putting an experienced, strongly pro-Ukraine leader with a reputation for conciliation at the head of the alliance.

Mr. Rutte, 57, will take over from Jens Stoltenberg on Oct. 1, at a difficult time for NATO in the face of Russia's war against Ukraine and in the midst of a tight race for the American presidency that could bring Donald J. Trump, who disparages the alliance, back into power.

The decision, sealed by NATO ambassadors during a meeting at the 32-nation alliance's headquarters in Brussels, removes a potentially contentious issue from the alliance's 75th anniversary summit meeting next month in Washington.

---

[1]

Sam Staton "Algebraic Effects, Linearity, and Quantum PLs" (POPL 2015)

Abstract

We develop a new framework of algebraic theories with linear parameters, and use it to analyze the equational reasoning principles of quantum computing and quantum programming languages. We use the framework as follows:

- we present a new elementary algebraic theory of quantum computation, built from unitary gates and measurement;
- we provide a completeness theorem for the elementary algebraic theory by relating it with a model from operator algebra;
- we extract an equational theory for a quantum programming language from the algebraic theory;
- we compare quantum computation with other local notions of computation by investigating variations on the algebraic theory.

1. Introduction

Quantum programming languages test many of the challenges of modern programming language theory: linear use of resources, separation, locality. A good way to understand a programming language is to understand equality of programs. In this paper we develop a general algebraic framework for computational effects involving linear resources. We use it to give a complete axiomatization of equality of quantum programs.

What is quantum computing? From a programming language perspective, quantum computing involves qubits and entanglement:

- *There is a type* qubit *of qubits.* Viewed as an abstract type, we can imagine a qubit as having an internal state that is a position on the surface of a sphere (called the Bloch sphere), but the accessor functions do not actually permit us to read its position on the surface. The three accessor functions are, informally, as follows. (*Notation:* we underline them.)
  - new: allocate a new qubit, with initial position at the top of the Z axis (called $|0\rangle$).
  - $\underline{\text{apply}}_{\mathtt{U}}$: apply a rotation to the qubit on the sphere around a given axis by a given angle, as specified by a unitary matrix U. For example, we can kind-of negate a qubit by rotating it by 180° around the X axis, taking the top of the sphere to the bottom; this unitary rotation is notated X, and so the function that applies the rotation is notated $\underline{\text{apply}}_{\mathtt{X}}$.
  - measure: make a random boolean choice, with the probability of returning either 0 or 1 depending on the Z co-ordinate of the qubit (this is called the standard basis). For example, if the qubit was on the X axis, the result of measuring will be 0 or 1 with equal probability, like tossing a fair coin; if it was at the very top of the sphere, the result of measuring will be 0 with certainty; if it was at the very bottom of the sphere, the result of measuring will be 1 with certainty. Measuring a qubit destroys it: all that remains is the result of the measurement.
- *For types A and B, there is a type $A \otimes B$ of entangled pairs.* For instance the type qubit $\otimes$ qubit is a type of pairs of possibly entangled qubits. Entanglement is achieved by controlled unitary rotations. For example, the controlled-X unitary, cX, affects two qubits, and if t is an expression of type qubit $\otimes$ qubit then also $\underline{\text{apply}}_{\mathtt{cX}}(t)$ is an expression of type qubit $\otimes$ qubit. The computation $\underline{\text{apply}}_{\mathtt{cX}}(a, b)$ is like 'if a is 1 then return $(a, \neg b)$ else return (a, b)', so that the second value returned depends on the first value input. The entanglement occurs because this controlled rotation happens without actually measuring a, and indeed it is reversible. Yet if a is subsequently measured then the controlled rotation appears to have behaved in this way.

The main contribution of this paper is the fact that the relationship between unitary rotations and measurement can be completely described by three simple axioms (Theorem 9), and allocation by two simple axioms (Theorem 11). This simple axiomatization (combined with the unitary groups and commutativity laws) completely characterizes earlier models that are built from operator algebra and functional analysis.

In the remainder of this introduction, we give an informal overview of these results. To express the equations, we need to first discuss the syntax.

The Golden Rule

One must always remember to

> Dissociate and judge whether what you have made is any good.

Would you from 2 years ago have been able to read your prose?

Bad work does not imply anything about you.

You can always do better.

In general:

> You are not your academic work.

Finally, remember that **people forgive**, and **people forget**.

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

2

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

2 1

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

2 1 0

My first ever submission: LICS 2016

On the Semantics of Intensional Recursion

G. A. Kavvos

Department of Computer Science, University of Oxford

alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, the classic results of Kleene, Gödel, Tarski, and Rice are very simple to reproduce. Moreover, it is easy to isolate the expressive power required to reproduce them.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

2 1 0 -1

Review #1: The supportive mentor (2)

[...] This is a very interesting new approach to an important problem in the theory of programming languages (and indeed in logic more generally). The present paper has the character of offering some first steps in a promising new direction (indeed the author himself describes it as a 'first attempt' at a categorical framework for the notions in question), but the steps taken are nonetheless encouraging ones, and most particularly the existence of such a natural source of examples from realizability strikes me as positive.

[...]

I would warmly recommend acceptance of this paper, subject to a few corrections and possible improvements as detailed below.

Review #2: The friendly but tough reviewer (1)

This is interesting and timely work, and the paper is well-written. The 2-categorical framework reminds me somewhat of old work on 2-categorical treatments of rewriting [...] but exposures and the treatment of quoting and evaluators are new and really quite elegant. And many of the ideas touched on in the paper are relevant to current research of a slightly more applied nature. [...]

My only reservation is that there isn't yet much in the way of a "payoff". Some extremely promising foundations have been laid, but so far the actual results are mostly in the form of abstract reformulations of classical ones, with a number of conjectures and open questions.

I do feel the paper would be stronger if there were at least an outline of an application to, say, safe reflective programming, or what it might say about sequentiality (e.g. parallel-or being definable with intensional recursion).

Review #3: The discombobulated reviewer (0)

“ [...] The paper is clearly in the scope of LICS. The results it contains are original and interesting. However, I found the paper very difficult to read and fully understand because of the very compact way in which it is written: For definitions and explanations of the terminology in statements of known theorems the reader is simply sent to textbooks; proofs are not provided for many of the theorems which are contributions of the paper; and I found the explanation of the way in which the results by Gödel, Tarski, Kleene and Rice are retrieved very sketchy.

In conclusion, although I think that the research line presented in this paper is very interesting and worth pursuing, I am reluctant to recommend acceptance in the present form.

My overall evaluation is therefore "borderline".”

Review #4: The curmudgeon (-1)

"[...] I am sympathetic [...] that this may yet yield something interesting. Furthermore, the author is clearly a good writer! However, at the moment there is too much enthusiasm and not enough depth of detail in the development for me to even make a useful evaluation of the work. [...] The issue is, of course, not whether these results can be dressed up in this manner but whether dressing them up in this manner throws useful new light on these phenomena. In my opinion the jury has to remain out on that ...

The idea of an exposure seems neat and the idea to use this to express simulations seems to me to hold some promise. I am not actually convinced the author has quite hit the right structure yet (and I include below some places to to look for further ideas).

The author seems to have some significant gaps in his scholarship. Some of the work below I think may be useful although they are not directly about intensional/extensional issues."

First resubmission: CSL 2016

On the Semantics of Intensional Recursion*

G. A. Kavvos

Department of Computer Science, University of Oxford
Wolfson Building, Parks Road, Oxford OX1 3QD, United Kingdom
alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, classic results by Kleene, Gödel, Tarski, and Rice are reproducible in a simple algebraic style.

First resubmission: CSL 2016

On the Semantics of Intensional Recursion*

G. A. Kavvos

Department of Computer Science, University of Oxford
Wolfson Building, Parks Road, Oxford OX1 3QD, United Kingdom
alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, classic results by Kleene, Gödel, Tarski, and Rice are reproducible in a simple algebraic style.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

First resubmission: CSL 2016

On the Semantics of Intensional Recursion*

G. A. Kavvos

Department of Computer Science, University of Oxford
Wolfson Building, Parks Road, Oxford OX1 3QD, United Kingdom
alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, classic results by Kleene, Gödel, Tarski, and Rice are reproducible in a simple algebraic style.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

First resubmission: CSL 2016

On the Semantics of Intensional Recursion*

G. A. Kavvos

Department of Computer Science, University of Oxford
Wolfson Building, Parks Road, Oxford OX1 3QD, United Kingdom
alex.kavvos@cs.ox.ac.uk

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, classic results by Kleene, Gödel, Tarski, and Rice are reproducible in a simple algebraic style.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

1 1

First resubmission: CSL 2016

On the Semantics of Intensional Recursion*

G. A. Kavvos

Department of Computer Science, University of Oxford
Wolfson Building, Parks Road, Oxford OX1 3QD, United Kingdom
`alex.kavvos@cs.ox.ac.uk`

Abstract

We revisit the concept of intensionality and its relevance for computer science, as well as the ways in which 'intension' can be turned into a logical construct. We describe the need for bicategories in that endeavour. Then, inspired by the categorical semantics of modal logic, we introduce exposures, a new 2-categorical construct that is meant to abstractly capture intensional constructions, e.g. Gödel numberings. In our new framework, classic results by Kleene, Gödel, Tarski, and Rice are reproducible in a simple algebraic style.

Reviews?

(2 = strong accept; 1 = weak accept; 0 = borderline; -1 = weak reject; -2 = strong reject)

1 1 -2

CSL reviews

[**1**, conf. 4] “The idea is appealing at first sight but at second look is presumably just a bureuaucratic description of what one does when one reasons about realizability models via realizer hacking. It’s not clear what one gains by this bureaucracy!

But it’s a funny idea and the paper is written in a very convincing style for which reason I am in favour of a weak accept.”

[**1**, conf. 4] “This is a curious paper [...] somehow nothing seems to happen in the paper [...] and yet there is a sense that the organisation provided by the new machinery of "exposure" is a worthwhile way to set things up.”

[**-2**, conf. 4] “I think that the paper contains a number of interesting ideas, [...] I feel quite uncomfortable about the general presentation [...] the true contribution of the paper – which, I am ready to accept, is not entirely negligible, but certainly less than the author claims [...] the two illustrations [...] do not shed light on on the main property required of exposures: the fact that 2-cells in the target bicategory are reflected in the source bicategory. Indeed, in both cases, [...] the property is essentially trivial.”

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

Reviews?

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

Reviews? **2**

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

Reviews? **2** **2**

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

Reviews? **2** **2** **1**

The trifecta: FoSSaCS 2017

On the Semantics of Intensionality

G.A. Kavvos(✉)

Department of Computer Science, University of Oxford, Wolfson Building,
Parks Road, Oxford OX1 3QD, UK
alex.kavvos@cs.ox.ac.uk

Abstract. In this paper we propose a categorical theory of intensionality. We first revisit the notion of intensionality, and discuss its relevance to logic and computer science. It turns out that 1-category theory is not the most appropriate vehicle for studying the interplay of extension and intension. We are thus led to consider the P-categories of Čubrić, Dybjer and Scott, which are categories only up to a partial equivalence relation (PER). In this setting, we introduce a new P-categorical construct, that of exposures. Exposures are very nearly functors, except that they do not preserve the PERs of the P-category. Inspired by the categorical semantics of modal logic, we begin to develop their theory. Our leading examples demonstrate that an exposure is an abstraction of well-behaved intensional devices, such as Gödel numberings. The outcome is a unifying framework in which classic results of Kleene, Gödel, Tarski and Rice find concise, clear formulations, and where each logical device or assumption involved in their proofs can be expressed in the same algebraic manner.

Reviews? **2** **2** **1** Good enough to get in!

Rebuttals and revisions

My personal strategy:

> Every negative reviewer comment is **your own fault**.

Possible reasons:

- You did not prove a result that the community expects.
- If you deviated from expectation, you did not explain why.
- You set up questions you did not answer.
- You did not communicate the significance of your results.
- You did not provide enough examples to demonstrate the range.
- You did not relate your results to the literature.
- Your writing was unclear.

Perhaps all of these are true. Even so, remember that

> You are **not** your work. Try again; make it better this time.

Writing rebuttals: how to get it wrong

The review:

"The work has a slightly preliminary feel: only box modalities are considered, commuting conversions are rather glossed over, completeness theorems [...] are only mentioned in passing."

My first draft:

"Whereas it is true that proving completeness of the categorical models requires a lot more commuting conversions, they are sweepingly general, and mostly standard. The three commuting conversions presented in section V.A are used to prove the subformula property (Theorem 9), thereby giving "moral" weight to the Curry-Howard correspondence (computatation eliminates cuts, and with them all "structurally irrelevant" formulae etc.).

The reviewer is very right to raise an issue regarding the correspondence between systems. The final paragraph of the introduction states that the Hilbert systems are equivalent to the dual-context systems. I have changed the presentation so that this is now a theorem, as it should have been from the start. Many thanks for spotting this. For want of space, I have left completeness theorems for the full version."

What is wrong with this?

Writing rebuttals: how to get it right

The review: “The work has a slightly preliminary feel: only box modalities are considered, commuting conversions are rather glossed over, completeness theorems [...] are only mentioned in passing.”

The final rebuttal:

“The set of commuting conversions required to prove completeness of the categorical semantics make the "let" construct commute with all non-modal contexts. The limited set of three commuting conversions presented in section V.A is exactly sufficient to prove the subformula property (Theorem 9), thereby giving "moral" weight to the Curry-Howard correspondence (computatation eliminates cuts, and with them all structurally irrelevant formulae etc.).

The final paragraph of the introduction states that the Hilbert systems are equivalent to the dual-context systems. This is a theorem in the full version, and it should have been one here too. The proof is too long to include in the paper, and so are the proofs of the completeness theorems for the categorical semantics.”

The paper got in.

Conclusions

Communication is very difficult.

Conclusions

Communication is very difficult.

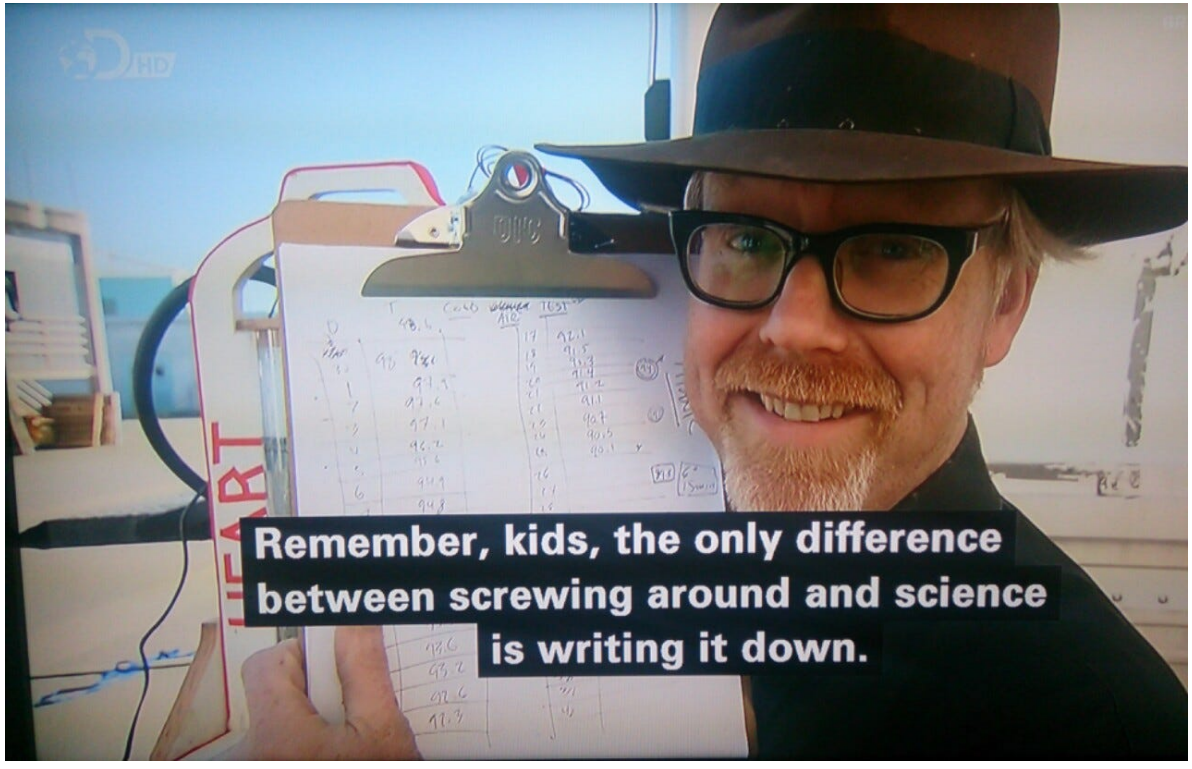
It is even more difficult when technical material is involved.

Conclusions

Communication is very difficult.

It is even more difficult when technical material is involved.

But there is no science without it.

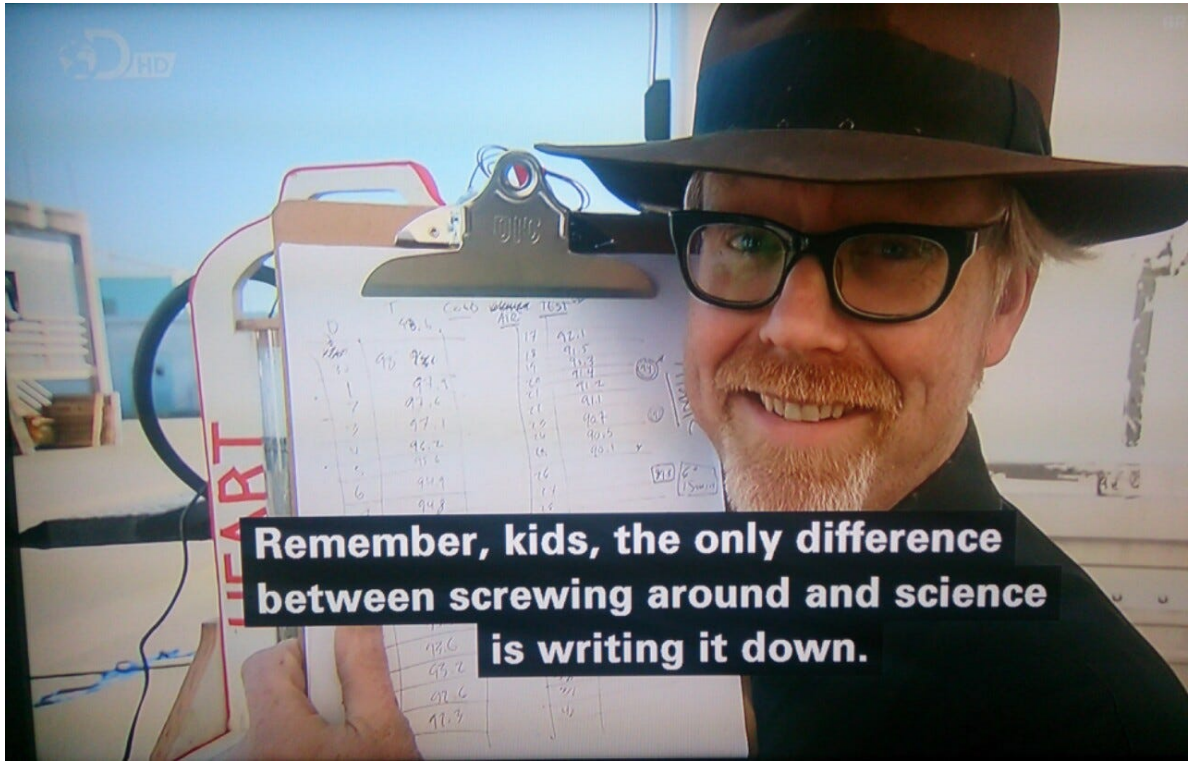


Conclusions

Communication is very difficult.

It is even more difficult when technical material is involved.

But there is no science without it.



Thank you for your attention!