ACT 2019 Questionnaire

Relevant Background:

I have a B.Sc Mathematics from the University of Utah (graduated 2014), focusing on Topology and Geometry. I took graduated courses in Algebraic Topology, which naturally entails a certain amount of familiarity with Category Theory. Additionally, in order to save for future graduate studies, I have entered the Software industry as a Functional Programmer for 4 years and been employed as a Haskell engineer for 1 year. I was recently elected to the Haskell.org committee, and have recently begun contributing to the Lens library. I am also the leader of the new NYC Homotopy Type Theory meetup.

Ph.D Date

Not applicable, as I am not in school. I am saving for grad/Ph.D school in the future, for which my intent is to study Homotopical Algebra and higher category theory.

Order of project preference

1. Bartosz Milewski: - *Traversal optics and profunctors*
2. Tobias Fritz - *Partial evaluations, the bar construction, and second-order stochastic dominance*
3. Pieter Hofstra - *Complexity classes, computation, and Turing categories*
4. Mehrnoosh Sadrzadeh - *Formal and experimental methods to reason about dialogue and discourse using categorical models of vector spaces*
5. Miriam Backens - *Simplifying quantum circuits using the ZX-calculus*
6. David Spivak - *Toward a mathematical foundation for autopoiesis*

To what extent can you commit to coming to Oxford

100%. The co-founders of my company have been very encouraging and have agreed to help fund these 2 weeks in Oxford.

Brief Statement:

The main purpose I am applying to ACT 2019 is not just because it can help my career as a Haskell programmer – that is only incidental. My real love is Algebraic Topology and Homotopical Algebra, and I feel that ACT 2019 can help provide insights that I will use throughout my future career as a mathematician when I am finally able to go to school for my Ph.D. I am mostly autodidactic in my approach to the subject, and being able to learn from masters of Category Theory for the first time. I hope this will provide an understanding of the formality and content of the field as I enter into it. Incidentally, though, as a Haskell

programmer, Profunctor optics and Category Theory are ubiquitous I the field. A firm grasp of the theory would alow me to better contribute my skills ot open source work I service to the Haskell ecosystem, as well as the code I write providing business value and open source tools.

Emily Pillmore

Personal Data

Place and Date of Birth:	California, USA | 28 Feb 1990
Address:	459A Prospect Ave 1, 11215, Brooklyn, NY, USA
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Work Experience

Current | Haskell Engineer at Kadena , Brooklyn, NY
July 2018 | *PLT, Distributed Systems, Formal Verification*

Lead maintainer of the Pact smart contract language, a Lisp-like implementation of System F with Hindley-Milner type inference. Additionally, brought transparent ML-style signatures that incorporate theorem proving via Z3, as well as Coq verification to the semantics of the language (in progress). Other duties include helping to write a Proof-of-Work blockchain, specifically the mempool, mining strategy, and coin aspects of the blockchain ecosystem.

2016-2018 | Senior Software Developer at Cake Solutions, NYC
Distributed Systems at Scale

Streaming architecture and distributed systems for Disney Streaming (a Cake Solutions client), working on the ESPN livestream and VOD architecture. This role was primarily functional programming in Scala, with Haskell PoC's, serving millions of concurrent users daily. Focus was on the DRM protocols and Ad Services.

2015-2016 | Consultant at *BCG* , NYC

Data analysis, CCAR audit, audit consulting, model validation, reverse model engineering, technical documentation, statistical analysis

Education

May 2014 | Bachelor of Science in Mathematics, **University of Utah**, Salt Lake City
Emphasis on Topology and Geometry | Major: Mathematics

Achievements include: TA for Introduction to Algebraic Topology II (MA5520) ,
participant in student lecture series giving talks on the following:

- The Word distance, Hyperbolic Groups, and the Milnor-Svarc lemma
- Simplicial, Singular, and Cellular Homology
- The Baire Category Theorems
- Geometric Group Theory

Accolades and Extracurriculars

January 2019	Elected to the Haskell.org committee
November 2018	Co-author of a patent (in progress) for Formally Verified Signatures for use in Smart Contracts
December 2018	Organizer of the NYC HoTT Reading Group and Meetup
April-Present 2018	Board-member of Functional Conf in Bengaluru

Open Source Contributions

Author:	cabal-hoogle
Maintainer:	Scalaz, ZIO
Contributor:	Cabal, Lens, Pact, Scanamo

Languages

English:	Primary
Spanish:	Conversant
French:	Basic Knowledge

Academic Interests

My current academic focus is building towards understanding Homotopical Algebra and Higher Category Theory. While in the past my studies have focused on Geometric Topology, Category Theory and its relation to topology have been my new focus.

Other Interests and Activities

Trail Hiking, Music (I am a fairly competent Latin Jazz guitarist), hobbyist electronics engineer (building guitar amplifiers and electronics components for guitar)

January 23, 2019

To Whom It May Concern:

I would like to formally recommend an employee of mine, Emily Pillmore, for acceptance to Adjoint School, ACT 2019. In her role as a Senior Haskell Engineer, she works with both the Pact smart contract language development team, and as a member of our public and private blockchain technology team. Emily regularly contributes to Haskell's open source ecosystem, including the Control.Lens library, and currently serves as a member of the Haskell.org committee. Additionally, she's founded a variety of reading groups and meetups around New York City, and currently hosts the NYC Homotopy Type Theory meetup.

Emily received a B.Sc. in Mathematics with an emphasis on Algebraic Topology from the University of Utah. She has continued to study these disciplines, with addition of Category Theory, and has employed them to great effect in Haskell's ecosystem. Emily remains an excellent student, and shows considerable potential in both her work life and future career as a mathematician. She also happens to be a very grounded and a pleasant person to interact with.

I hope you find her resume appealing, and give her the opportunity for a potential placement. I would be more than willing to further discuss her background if you wish to contact me. I wholeheartedly recommend Emily for Adjoint School, ACT 2019.

Sincerely,

Will Martino
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