

Background and Motivation

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Karlsruhe, 24 January 2019

Dear Madam or Sir,

finishing my parallel undergraduate studies of mathematics and informatics at the Karlsruhe Institute of Technology, I developed extended interest in abstract mathematics, in particular algebra, commutative algebra and logic. As unifying language of these topics category theory quickly became a primary focus of my studies. My current background in category theory can be summarised as follows:

- I took part in an introductory seminar to category theory, in which I held a presentation about *abelian categories*.
- Attending a lecture about commutative algebra I came in contact with *homology* and *derived functors*.
- Lately I am participating in a private reading seminar about *proarrow equipments* and *formal category theory* hosted and supervised by Dr. Tobias Columbus.

Having interest in theoretical computer science, I have wondered, whether category theory could be applied to formalise notions of computation and complexity. Since I required a topic for my bachelor thesis, which satisfies the requirements of both the department of mathematics and of the department of computer science, I did some research and stumbled upon *Turing categories*. Having convinced supervisors from both departments I will write about them in spring to summer 2019.

Naturally this constitutes my motivation to take part in the ACT2019 school, to be precise in Hofstra's project about *Turing categories*. Since I will be forced to read the papers specified in the project's description in any case, I might as well discuss them with others helping to improve general understanding. Moreover, planning to intensify my studies of category theory by changing to a different university to achieve a master degree in mathematics, attending ACT2019 would give me the opportunity to make first contact with other category theorists. Looking further into the option of acquiring a Ph.D, these contacts and having experienced proper mathematical collaboration could become advantageous.

Making first small steps towards a career in mathematics, I unfortunately cannot say anything about when I finish (or even start) my Ph.D and what its topic will be. The only thing I know is that I am dedicated to get this far and that its topic is very likely to include category theory.

I feel very sorry for restricting my application to Hofstra's project about *Turing categories* and would absolutely understand it to be a reason to exclude me from the ACT2019 school. Unfortunately I cannot predict my workload induced by my bachelor thesis and general studies in the upcoming months. Regretfully I am not able to promise commitment to other undoubtedly interesting projects since I am supposed to focus on graduation.

Nevertheless I am really thankful for the opportunity and would really appreciate taking part.

Sincerely,
Jonas Linssen

Curriculum Vitae

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Name	Jonas Linssen
Date of birth	20/06/1997, Neuss, Nordrhein-Westfalen
Education	<p>Karlsruhe Institute of Technology, Karlsruhe, Baden-Württemberg Since winter 2015/16 Parallel undergraduate studies of mathematics and informatics</p> <p>Quirinus Gymnasium (Highschool), Neuss, Nordrhein-Westfalen Since summer 2007 Attained talent program “Jugend Aktiv“ in winter 2014/15 Graduation 2015 with commendation for excellence in mathematics Abitur grade 1,2 (very good)</p>
Language skills	<p>German Mother language</p> <p>English Language trip to England in summer 2013 Advanced course English in abitur</p> <p>Latinum</p>
Work experience	<p>School internship, Düsseldorf, Nordrhein-Westfalen Two week internship at the department for applied programming of the Provinzial-Versicherung Rheinland in spring 2013</p> <p>Teaching Supervisor for tutorials about <i>Linear Algebra</i> and <i>Introduction to Algebra and Number Theory</i> from autumn 2017 to summer 2018</p>
Activities	<p>Aviation Joined Aero-Club Grevenbroich-Neuss in summer 2011 Acquired private pilot's licence for sailplanes in spring 2015</p> <p>Event technology Basic knowledge of sound- and lighting engineering Technical provider for concerts in religious context</p> <p>Programming Very good knowledge of Java Knowledge of C, Python, PHP, SQL, Delphi, Dart</p> <p>Music Piano lessons from 2003 to 2015 Clarinet lessons from 2007 to 2010 Pianist at concerts within religious context</p>
References	<p>PD Dr. Stefan Kühnlein - stefan.kuehnlein@kit.edu Dr. Tobias Columbus - tobias.columbus@kit.edu</p>

Dear Madam or Sir,

my name is Jonas Linßen and I am an undergraduate student of mathematics and computer science at the Karlsruhe Institute of Technology in Germany. With this email I would like to apply to the ACT2019 school, in particular to Hofstra's project regarding Turing categories.

My specific interest is based on the fact that I am going to write my bachelor thesis about this topic in the following months. I have written down my background and motivation into the attached file. My CV is attached as well.

A letter of recommendation will be send by PD Dr. Stefan Kühnlein. I hope I therefore fulfil the requirements of the application and would feel lucky to take part. In particular I am fully committed to come to Oxford.

Sincerely,
Jonas Linssen

To whom it may concern

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Datum: 28. Januar 2019

Letter of recommendation for Jonas Linßen

Jonas Linßen has applied for participation in your Adjoint School on Applied Category Theory, and I would certainly like to support his application by writing a letter of recommendation.

I do know Jonas since three years now. I am the advisor for his course of studies in Mathematics, and he was in several of my lectures. He also became one of our (roughly 30) student tutors for the course on Linear Algebra in Winter 2017/18. Jonas is very close to the end of his Bachelor Studies both in Mathematics and in Computer Sciences.

He was one of the driving forces who made me organize a students seminar on the basics of category theory last summer. He works on category theory ever since and participates a reading course on formal category theory with Tobias Columbus, which still goes on although Tobias changed position to Saarbrücken. He attended Fabian Januszewski's course on Commutative Algebra which had a strong focus on methods from category theory.

He certainly has understood more than just the basics in category theory and plans to write a Bachelor Thesis on Turing categories which can be used for both courses of study he is enrolled in.

Given his youth I cannot really assess his potential to do research, but he certainly would benefit tremendously from taking part in your Adjoint School.

I strongly support his application.

Best regards

Stefan Kühnlein