

Application for PhD position at the University of Amsterdam

Faculty of Science

Institute for Logic, Language and Computation

Martin A. Miguel

m2.march@gmail.com

May 4, 2015

May 5, 2015

Dear selection committee:

Hello, my name is Martin Miguel. I am a soon-to-be Computer Science Master from the Universidad of Buenos Aires, Argentina. I am currently wrapping up my Master's Thesis on music cognition topics. My thesis topic is modeling tactus inference (or BI) but looking for a model that can provide insight on how we synchronize with music when we hear it. I heard of the doctoral opportunity by following the music cognition blog by Prof. Dr. H. Honing.

I am currently being advised by Dr. Diego Fernandez Slezak from the Applied Artificial Intelligence Lab at UBA.¹ He can be reached for references at dfslezak@dc.uba.ar.

I got into the field of music cognition out of curiosity for the musical processes that happen in a listener's mind. I have been dancing and playing music for over 10 years now and I am very curious about what's the magic that makes us twitch. In particular, I have been learning to tap dance for the last 4 years and I have found some rhythmical passages that are particularly evocative. This is not common in tap dancing passages and I am afraid that comes from lack of theoretical knowledge on how to produce rhythms. The issue lead to the idea of trying to model some of the rhythmical cognitive processes in play in order to develop a tool that can help tap musicians get closer to their own productions. In particular, I want to make situations of tension and unexpectedness in music explicit, being this what I believe makes this passages so interesting. The focus is on rhythmical expectations, i.e. expectations on the timing of musical events.

I will be graduating with a Bs + Ms by the end of June. I am very interested in further pursuing my line of research, but I'm looking towards doing so among people who know the subject better. Sadly, there is no one else at UBA working on these topics. As a future view, I'd like to enhance my model (or work on another one) to try to capture the whole human process of understanding rhythmicality. I'd also like to apply this rhythm perception model to other situations such as the timing of speech in drama performances, oral storytelling and stand-up comedy.

The research goals within ILLC match my interests perfectly. The music cognition group² shares my interest in expressive performances and their cognitive interpretation.³ It also shares part of my methodology: computational modeling based on statistical tools.⁴ As further reference, a work in progress paper by myself can be read here.

I am hoping that through this application a conversation can be started towards how related my research interests are with those of the MCG and how I can be of assistance to it as well as how it can help me grow and pursue my goals.

Yours sincerely,

Martin A. Miguel

¹<http://liaa.dc.uba.ar/>

²<http://cf.hum.uva.nl/mmm/>

³Honing, H. (2013). The structure and interpretation of rhythm in music. In Deutsch, D. (ed.), *Psychology of Music*, 3rd edition (pp. 369-404). London: Academic Press.

⁴Sadakata, M., Desain, P. & Honing, H. (2006). The Bayesian way to relate rhythm perception and production. *Music Perception*, 23(3), 267-286. (c) 2006

May 4th, 2015

Dear Colleague,

I am writing in behalf of Martin Miguel to support his candidacy for the PhD candidate at the Institute for Logic, Language and Computation. Martin has been doing his final thesis for the last 8 months, in the Computer Science Department, Universidad de Buenos Aires under my supervision.

I became acquainted with Martin almost one year ago, when he presented himself asking for thesis supervision. He showed a great enthusiasm in researching about music perception and understanding different aspects of music cognition. From the very first moment, he showed an extremely open mind with great motivation with interdisciplinary work. Martin's first steps as a student were exceptional because he managed to start, develop and consolidate on his own a completely new theme, something which is completely unusual and which only the top 1% of students with a tremendously determined drive can achieve.

Now, we are finishing his project which I have no doubt will be published in a very prestigious research journal.

Hence, I state that Martin Miguel will graduate before July 2015, and I recommend him as an ideal candidate for the PhD position.

A handwritten signature in black ink, consisting of a stylized 'D' followed by a lightning bolt-like symbol, all enclosed within an oval shape.

PhD. Diego Fernández Slezak
Computer Science Department

Martin Miguel

Curriculum Vitae

Almagro, Capital Federal
Buenos Aires, Argentina

☎ 54-11-31816018

☎ 54-11-49834768

✉ m2.march@gmail.com

🌐 m2march



Objective

My current aspiration is to partake in intriguing and thrilling projects of great value. I intend to use my creativity, entrepreneurship and both technical and social skills for the development and delivery of such projects. I also look forward broadening and deepening technical knowledge that will allow me to provide faster and more accurate and sound solutions to problems; as well as tackling new challenges. I want to improve my soft skills –understand processes, organization, soft requirements and team dynamics –, since they are also key for the success of enterprises.

Professional/Personal Profile

- Analytical, methodical, reliable
- Curious, investigator, innovator
- Passionate, driven
- Well-mannered, affable, thoughtful

Work Experience

- Now **Software Engineer**, *MateMarote*, Development of java backend infrastructure and javascript videogames for a neuroscientifically based educational software.
- April 2015
- April 2014 **Intern Software Engineer**, *Google.com*, Development and extensions of testing frameworks
- January 2014 for performance, end-to-end and regression tests.
- December **Java Programmer**, *Despegar.com*, Development of components integrating a larger application system. Development of web applications and utility frameworks.
- 2013
- August 2012
- July 2012 **Assistant Professor of Algorithms and Data Structures I & II**, *Computer Science Major*
- March 2011 - *Universidad de Buenos Aires*.
- January 2010 **Jr. Java Programmer (J2ME / Blackberry)**, *SenseByte*, Development of both stand-alone
- January 2009 and client-server applications. Development of applications interfacing with non-standard hardware.

Education

- Today–2008 **Computer Science Program (equivalent to Bachelor + M.S. degree)**, *Universidad de Buenos Aires - FCEyN*.

English Studies - Advanced Level

- 2006 **FCE - First Certificate in English**, *AACI*, Grade A
University of Cambridge, ESOL Examinations.

2004 **CILE 3 - English Certificate**, *Facultad de Filosofía y Letras, UBA*, Score: 80/100.

IT Profile

Programming Languages

Advanced **C, Python, Java**
Working **Groovy, C++, Intel x86 Assembler, Scala, \LaTeX , Octave**
Learners **Haskell, ActionScript 2.0, Ruby**

IT Achievements

Master's Thesis —in progress— on the evaluation of perceptual models for rhythms applied to tap dancing.

Research study in recommender systems for music.

Research study on algorithm optimization using SIMD (Intel's SSE instruction set).

Research study on heuristic methods to play a Zero-Sum board game.

Development of a basic monolithic kernel for x86 architecture based on UNIX ideas.

Experience on 3-stage software development starting on model specification on a theoretical level, moving to data structures definition in order to meet complexity restrictions, finishing with actual implementation of the defined code.

Transcript

Compulsory	○ Calculus	9
	○ Algebra	5
	○ Probability and Statistics	10
	○ Algorithms and Data Structures I	10
	○ Algorithms and Data Structures II	10
	○ Algorithms and Data Structures III	9
	○ Computer System Architecture I	8
	○ Computer System Architecture II	8
	○ Operating Systems	10
	○ Numerical Methods	10
	○ Software Engineering I	7
	○ Software Engineering II	9
	○ Systems Networks	10
	○ Database Systems	9
	○ Logic and Computability Theory	9
	○ Language Theory	10
	○ Programming Paradigms	10
Optional	○ Neural Networks	9
	○ Introduction to Speech Technologies	9
	○ Game Theory	Final Exam Pending
	○ Operating Systems Development	10
	○ Machine Learning	Final Exam Pending

Grade scale: 10

GPA

9.05

Expected graduation date

July 2015

Interests

Special interest in Computer Music —musicological analysis with a computer— and Cognitive Musicology — development of computer models for the cognitive processes of music.

Special interest in sound disciplines such as *speech processing* and *speech production*.

Special interest in *human behaviour modeling* through *machine learning* methods.

Special interest in low-level software development and *real-time systems*.

Other technical knowledge

Graphic and web design tools expertise: Adobe Photoshop, Adobe Flash

Familiar with both Microsoft and Linux OS Technologies (Windows, Ubuntu)