

# Marco Cognition

+1-850-694-4006  
✉ [cognition.marco@gmail.com](mailto:cognition.marco@gmail.com)  
📄 [mcognition.github.io](https://github.com/mcognition)

Research interests include Automata and Formal Language Theory, String Algorithms, Scientific Computing, and Mathematical Software.

## Education

- 2016-2018 **MS Computer Science**, *Yonsei University*, Seoul, South Korea.
  - Advisor: Dr. Yo-Sub Han
  - Thesis: *Efficient Algorithms for Two Parsing Problems on Probabilistic Finite Automata*
- Spring 2016 **Non-Degree Seeking Graduate Student**, *Florida State University*, Tallahassee, Florida.
- 2011-2015 **BS Discrete Mathematics**, *Georgia Institute of Technology*, Atlanta, GA.
  - Minor in Korean
  - Advisor: Dr. Anton Leykin
  - Thesis: *Straight Line Programs and Automatic Differentiation in Python*

## Work Experience

- 08/19-Present **Software Engineer**, *Google*, Mountain View, CA.
  - Software engineer on the Google Keyboard (Gboard) team.
- 02/19-05/19 **Software Engineering Intern**, *Google*, New York City, NY.
  - Software engineering intern on the OpenFST team within the Speech and Language Algorithms research group.
  - Developed a compression scheme for finite-state transducers used in keyboard language models which led to a first-author publication.
- 09/16-12/18 **Graduate Teaching Assistant**, *Yonsei University*, Seoul, South Korea.
  - TA for CSI2103 Data Structures, CSI 3108 Algorithm Analysis, CSI3109 Automata and Formal Languages, and CSI6512 Graduate Analysis of Algorithms.
- 01/16-05/16 **Upper School Computer Science Teacher**, *Maclay School*, Tallahassee, FL.
  - Taught Computer Programming I, an introductory Python course.
  - Faculty sponsor of the Computer Science Club. Club members learned to make games with Python, built an ALU, and participated in the Florida State University ACM programming competition.
- 05/15-08/15 **Data Science Intern**, *AirSage Inc.*, Atlanta, GA.
  - Used Python and QGIS to track and display population movement patterns.
  - Used Bash and Condor to optimize and automate large data analysis jobs.
- 05/12-08/12 **Software Development Intern**, *AirSage Inc.*, Atlanta, GA.
  - Used Python and Bash to analyze cell phone tower location logs.
  - Used Python and psycopg2 to construct and store geometric representations of cell towers' effective areas in a spatial database.

## Publications

- Jun-U Park, Sang-Ki Ko, **Marco Cognition**, Yo-Sub Han. *SoftRegex: Generating Regex from Natural Language Descriptions using Softened Regex Equivalence*. Empirical Methods in Natural Language Processing (EMNLP) 2019 (to appear).
- Marco Cognition\***, Cyril Allauzen, Michael Riley. *On the Compression of Lexicon Transducers*. Finite-State Methods and Natural Language Processing (FSM/NLP) 2019 (to appear).
- Marco Cognition\***, Yo-Sub Han, Soon Chan Kwon. *Online Infix Probability Computation for Probabilistic Finite Automata*. Association for Computational Linguistics (ACL) 2019.
- Marco Cognition\***, Yo-Sub Han, Soon Chan Kwon. *Incremental Computation of Infix Probabilities for Probabilistic Finite Automata*. Empirical Methods in Natural Language Processing (EMNLP) 2018.
- Marco Cognition\***, Yo-Sub Han. *Online Stochastic Pattern Matching*. International Conference on Implementation and Application of Automata (CIAA) 2018.

## Skills

**Programming Languages:** Python/Cython, Julia, Java, C, C++  
**Human Languages:** English, Korean

## Awards/Service

**Association for Computational Linguistics** - Student Volunteer (2019)  
**Yonsei University** - Outstanding International Student Scholarship  
**ACM International Collegiate Programming Contest** - Question Writer (Korea Regional - 2017, 2018)