# Marco Cognetta

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mcognetta.github.io

## 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*

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.
- Developing compressed statistical language models for mobile keyboard input.
- Building TensorFlow Federated infrastructure and compressed sketching models for privacy preserving federated analytics.
- TA for Google's Tech Exchange Applied Data Structures and Algorithms course (2020 and 2021).

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.
- Compression algorithm reduced the space requirements of the Gboard keyboard lexicon data structure by 90% compared to the uncompressed version and 58% compared to the previous production compression scheme.

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.

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 (* denotes primary authorship)

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

## Skills

**Programming Languages:** Python, C++, Julia
**Human Languages:** English, Korean, Esperanto