

# CV

Maria Dimakopoulou

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## EDUCATION

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### STANFORD UNIVERSITY

#### Ph.D. in Reinforcement Learning & Causal Inference

*Advisors: Professor Benjamin Van Roy & Professor Susan Athey*

*Dissertation: Coordinated Exploration in Concurrent Reinforcement Learning*

**GPA 4.27/4.30**

- Recipient of the Stanford “Outstanding Academic Achievement at the Doctoral Level” Award.
- Recipient of the “Arvanitidis in Memory of William K. Linvill” Stanford Graduate Fellowship.
- Graduated 1st of the class.

**6/2015 – 12/2018,**

**Stanford, CA**

### STANFORD UNIVERSITY

#### M.Sc. in Operations Research

**GPA 4.23/4.30**

- Recipient of the Stanford “Outstanding Academic Achievement at the Masters Level” Award.
- Graduated 1st of the class.

**6/2015 – 6/2016,**

**Stanford, CA**

### NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA)

#### M.Sc. and B.Sc. in Electrical Engineering & Computer Science Department

*Computer Science & Computer Systems Major, Management & Finance Minor*

**GPA 10.00/10.00**

- Graduated 1st of the class with the highest GPA in the 200 year history of NTUA.
- Ranked nationwide 1st in the 2009 NTUA EE/CS entry exams with a score 19920/20000.

**9/2009 – 6/2014,**

**Athens, Greece**

## PROFESSIONAL EXPERIENCE

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### SPOTIFY

*Home Product Area, Personalization Mission*

**1/2022 – present**

**Los Gatos, CA**

- **Senior ML Engineering Manager**
  - Leading a 15-people ML org, spanning ML engineering, ML research, backend engineering and data engineering and consisting of 2 teams; the Home Ranking team and the Home Assembly team.
  - Reinvented both teams’ identities, high-level strategies and tech visions, creating problem spaces which are both impactful to the company-wide business strategy and technologically cutting-edge.
  - Staffed and rebuilt the teams which, upon assuming my responsibilities, have doubled in size by attracting several new internal & external hires with diverse skillsets, backgrounds and experiences.
  - The **Home Ranking** team is responsible for developing a unified relevance ranker for all content on their way to Spotify’s Homepage. The team builds attention-based neural networks to create user & content embeddings which are reactive to listening behavior, contextual bandits to cold-start new content & reinforcement learning

to optimize for long-term listening engagement. In an online A/B test in Q2 2022, Home Ranking achieved a multiplicative engagement metric win over production from its attention-based user & content embeddings.

- The **Home Assembly** team is responsible for optimizing the personalized placement of organic and promotional content on Spotify's Homepage surface, in a way that is conducive to user satisfaction and Spotify business needs. The Home Assembly team uses causal inference and contextual bandits for automatically balancing the inventory of Spotify's homepage impressions across content types (music, podcast, audiobooks, e.t.c.) and content goals (organic vs. promotional recommendations). In Q2 2022, Home Assembly rolled-out a music/podcast balancing model that resulted in a strong long-term retention win for Spotify users.

## **NETFLIX RESEARCH**

*Product ML Research, Data & Insights*

**12/2018 – 1/2022**

**Los Gatos, CA**

- **Tech Lead Manager – Adaptive Experimentation (1/2020 – 1/2022)**
  - Built a cross-functional team of researchers, engineers and data scientists to deliver new experimentation capabilities as an alternative to A/B testing: (1) automated ML-based cell selection, (2) adaptive cell allocation rates during-test, (3) valid inference from adaptively collected data post-test, (4) ML-based short-term proxy metrics of long-term metrics to call A/B tests faster.
  - The adaptive experimentation technology was used on several Netflix Product areas (personalized rankers, copy optimization, globalization), establishing its ability to reach the same conclusions as a long-running A/B test with shorter test durations, fewer test members and better test member experience, even in the presence of non-stationarity and delayed outcomes.
- **Research Area Lead (8/2019 – 1/2022) – Causal Learning**
  - Pioneered the causal learning investment at Netflix and established its usage across Product areas (personalized message selection, personalized title selection on Netflix billboard, personalized title selection on Netflix rows and UI personalization).
  - Drove initiatives on the design and adoption of novel online algorithms and offline estimators in the intersection of causal inference & multi-armed/contextual bandits, authored internal causal learning reference guide and rallied support from Product to A/B test and deploy this methodology.
  - Coordinated causal inference & online learning research directions of the Product ML Research team, identifying collaboration opportunities with Product (Algorithms Engineering, Experimentation Platform).
  - Co-authored papers accepted in top-tier ML conferences and served as co-organizer or invited speaker in multiple internal forums and external venues.
- **Senior Research Scientist (12/2018 – 8/2019) – Messaging Personalization**
  - Designed the algorithm behind the first personalized message selection system at Netflix, which resulted in a significant A/B test win and was deployed in production. The bandit-style algorithm was optimized towards learning the causal effect of each message to each member's satisfaction.
  - Designed and published a slate bandit algorithm for personalized message creation that decomposes learning across the combinatorial slate space in a scalable way using marginal posterior sampling and proposed a reinforcement learning approach for multi-day message policy optimization based on Q-learning.

## **MICROSOFT RESEARCH**

*NYC Machine Learning Lab*

**6/2018 – 9/2018,**

**New York City, NY**

- **Value-Function Decomposition in Reinforcement Learning:** Developed an approach to break down complex RL tasks into many simpler ones that can be learned faster by multiple agents (with Miro Dudik, Rob Schapire).
- **Off-Policy Evaluation for Slate Contextual Bandits:** Developed a range of new off-policy estimators that exhibit

better bias-variance properties than existing ones in slate contextual bandit settings (with Miro Dudik).

**SALESFORCE**  
*Data Science Team*

**6/2016 – 9/2016,**  
**San Francisco, CA**

- **Multi-Touch Attribution:** End-to-end research and implementation of Salesforce DMP (f.k.a. Krux) Attribution product, involving game theory, causal estimation & budget constraint optimization. Launched it to a group of high-profile clients and represented it in Mobile Marketing Association's review for its 800 member-companies.

**GOOGLE**  
*Google Research*

**8/2012 – 11/2012; 7/2013 – 11/2013 & 11/2014 – 4/2015**  
**Paris, France & New York City, NY**

- **Ad Exchange Optimization Team:**
  - **Auction Reserve Price Optimization:** Developed a dynamic pricing algorithm that yielded annual revenue lift for Google's Real-Time Bidding in the scale of hundreds of millions of dollars. Launched it in the production Ad Exchange Dynamic Pricing Pipeline, with praise from the Google Ad Exchange VP.
  - **BIN-TAC Auction Mechanism:** Collaborated with USC Professor Hamid Nazerzadeh on the analysis and implementation of the BIN-TAC auction with revenue lift potential of 5% in the Ad Exchange.
- **Operations Research & Optimization Team:**
  - **Linux Kernel Performance Monitoring Subsystem Scheduling:** Led collaboration of the Operations Research team with the Linux Production kernel team to improve scheduling of hardware events on the processors' counters in the kernel. Designed an optimal algorithm, increasing by 18% the measurement accuracy and the hardware utilization, which was launched in the Google production kernel.
  - **Intel Performance Monitoring Unit Erratum:** Led collaboration of the Operations Research team with the Linux Production team and Intel to solve the 3-year unsolved measurement corruption erratum of Intel Performance Monitoring Unit. Designed a dynamic scheduling protocol solving the erratum, which was launched in Google production kernel & open-sourced in Linux kernel 4.1 benefitting 1000s of Intel machines.
  - **Earliness-Tardiness Scheduling:** Designed linear & mixed integer programming models for convex and non-convex cost optimization scheduling problems in Google Technical Infrastructure and Google Geo.
  - **Multi-Trip Vehicle Routing:** Designed heuristics and meta-heuristics for any generic routing model which produce 43% higher quality first solutions and find the optimal solutions 45% faster. The heuristics were launched in production and are run daily benefitting Google Geo related projects.
  - **Google OR-Tools Open-Source:** Designed open-source models for the NP-hard Radio Link Frequency Assignment problem teaching advanced usage of Constraint Programming methods in and out of Google.

## **PUBLICATIONS & PREPRINTS**

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- **Online Multi-Armed Bandits with Adaptive Inference**  
Dimakopoulou, Ren, Zhou – *NeurIPS 2021*
- **Post-Contextual-Bandit Inference**  
Bibaut, Dimakopoulou, Kallus, Chambaz, van der Laan – *NeurIPS 2021*
- **Risk Minimization from Adaptively Collected Data: Guarantees for Supervised and Policy Learning**  
Bibaut, Kallus, Dimakopoulou, Chambaz, van der Laan – *NeurIPS 2021*
- **Sequential Causal Inference in a Single World of Connected Units**  
Bibaut, Petersen, Vlassis, Dimakopoulou, van der Laan – *arXiv:2101.07380*

- **Doubly Robust Off-Policy Evaluation with Shrinkage**  
Su, Dimakopoulou, Krishnamurthy, Dudik – *ICML 2020*; *US Patent 16/657,533*
- **ADMM SLIM: Sparse Recommendations for Many Users**  
Steck, Dimakopoulou, Riabov, Jebara – *WSDM 2020*
- **Marginal Posterior Sampling for Slate Bandits**  
Dimakopoulou, Vlassis, Jebara – *IJCAI 2019*
- **On the Design of Estimators for Bandit Off-Policy Evaluation**  
Vlassis, Bibaut, Dimakopoulou, Jebara – *ICML 2019*
- **Balanced Linear Contextual Bandits**  
Dimakopoulou, Zhou, Athey, Imbens – *AAAI 2019*
- **Scalable Coordinated Exploration in Concurrent Reinforcement Learning**  
Dimakopoulou, Osband, Van Roy – *NeurIPS 2018*
- **Coordinated Exploration in Concurrent Reinforcement Learning**  
Dimakopoulou, Van Roy – *ICML 2018*
- **Estimation Considerations in Contextual Bandits**  
Dimakopoulou, Zhou, Athey, Imbens – *arXiv:1711.07077*; *NeurIPS 2017 ML & Causal Inference workshop*
- **Market-Based Dynamic Service Mode Switching in Virtualized Wireless Networks**  
Dimakopoulou, Bambos, Valdez-Vivas, Apostolopoulos – *IEEE PIMRC 2017*
- **Reliable and Efficient Performance Monitoring in Linux**  
Dimakopoulou, Eranian, Koziris, Bambos – *ACM/IEEE Supercomputing 2016*

## HONORS & AWARDS

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- **Spotify 20/20 R&D Senior Leadership Program (2022)**  
*selected in Spotify's annual R&D senior leadership cohort focused on "creating readiness for Director+ role within Spotify R&D" (20 managers selected annually from the 3k+ people R&D division of Spotify).*
- **Forbes 30 Under 30 Greece (2019)**  
*presented to "the brightest young entrepreneurs, leaders, and stars of Greek nationality worldwide".*
- **Stanford University Outstanding Academic Achievement at the Doctoral Level Award (2019)**  
*presented annually to the top graduating Ph.D. student of Stanford, MS&E.*
- **Stanford University "Arvanitidis in Memory of William K. Linvill" Graduate Fellowship (2015 – 2018)**  
*awarded annually to 1% of Stanford PhD students for excellence in research and study.*
- **Onassis Foundation Graduate Fellowship (2015 – 2018)**  
*awarded annually to the best performing Ph.D. students of Greek nationality worldwide.*
- **Stanford University Outstanding Academic Achievement at the Masters Level Award (2016)**  
*presented annually to the top graduating M.Sc. student of Stanford, MS&E.*
- **National Technical University of Athens Dean's Council "Papakyriakopoulos" Honorary Award (2015)**  
*presented annually to the best performing student in Mathematics coursework across all NTUA.*
- **Limmat Stiftung Foundation Academic Excellence Award (2015)**
- **Intel Honorary Award (2014)**  
*presented "in recognition for the creativity and drive in modifying the Linux Performance Monitoring Subsystem to improve the PMU accuracy in 1000s of Intel machines".*
- **Google Women Techmakers – Anita Borg Memorial Fellowship (2014)**  
*presented "for excellence in computer science and technology, outstanding academic achievement, leadership and community involvement".*
- **Google Spot Bonus Excellence Award (2013)**  
*presented for "multiple accomplishments and outstanding achievements in the Operations Research team".*

- **Google Peer Bonus Volunteering Award (2013)**  
*for “promoting careers in engineering to high-school girls and assisting Google's diversity efforts”.*
- **National Technical University of Athens Dean’s Council “Thomaidion” Honorary Award (2011 – 2015)**  
*for excellence in academic performance across all NTUA departments.*
- **State Scholarship Foundation of Greece Fellowship (2011 – 2015)**  
*for excellence in academic performance in NTUA’s Electrical Engineering & Computer Science department.*
- **NTUA Dean’s Council “Agoniston Polytechniou” Honorary Award (2011)**  
*for ranking nationwide 1st in the entry exams of NTUA’s Electrical Engineering & Computer Science.*
- **Triantafyllidis Foundation, Greek Finance Ministry & Greek Education Ministry Fellowship (2011)**
- **Eurobank EFG & Greek Education Ministry “Great Moment for Education” Honorary Award (2010)**  
*for ranking nationwide 1st in the entry exams of NTUA’s Electrical Engineering & Computer Science.*
- **26th National Mathematics Olympiad Silver Medal (2009)**
- **Hellenic Mathematical Society Silver Medal at the “Euclid” Contest (2008)**
- **6th European Union Science Olympiad Bronze Medal (2008)**
- **Hellenic Mathematical Society Bronze Medal at the “Euclid” Contest (2005 – 2007)**
- **Greek Educational Society High-School Excellence Award (2006 – 2009).**

## OTHER

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**Languages:** English, Greek, French  
**Interests:** Tennis, Swimming, Traveling, Art  
**Legal Status:** US Permanent Resident, Greek Citizen