# Constantinos Chamzas

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## Education

- **William Marsh Rice University** — Houston, TX, USA
  *Ph.D. in Computer Science, Advisor: Dr. Lydia E. Kavraki* — *Aug. 2017 – May 2023*
  - Thesis: Retrieval-Based Learning for Efficient High-DoF Motion Planning

- **Aristotle University of Thessaloniki** — Thessaloniki, Greece
  *Diploma in Electrical and Computer Engineering* — *Sep.2011 – Apr.2017*
  - Graduated with "Excellent," **8.86/10** cumulative average (Top 2%)
  - Thesis: Structural Analysis of Handwritten Equations Using Probabilistic Context-Free Grammars

## Work Experience

- **Worcester Polytechnic Institute** — WPI, Worcester
  *Assistant Professor, Robotics Engineering* — *July. 2023 – Present*
  - Teaching Courses: Robotic Motion Planning (RBE550), Machine Learning for Robotics (RBE577)
  - Research Areas: Learning and Planning, Planning under Uncertainty, Task and Motion Planning

- **Kavraki Lab,** http://kavrakilab.org/ — William Marsh Rice University, Houston
  *Graduate Student* — *Aug. 2017 – May 2023*
  - Authored research papers in Robotic Learning
  - Developed open-source software for educational and research purposes

- **NVIDIA Seattle Robotics Lab,** https://nvidia_srl.gitlab.io/ — NVIDIA, Remote
  *Research Intern* — *Sept. 2022 – Dec. 2022*
  - Worked on robust Task and Motion Planning

- **Adacomp Lab,** https://adacomp.comp.nus.edu.sg/ — NUS, Singapore
  *Research Intern* — *Jul. 2022 – Aug. 2022*
  - Developed a POMDP formulation for planning with manipulators

- **TracLabs Robotics Group,** https://traclabs.com/ — TracLabs, Houston
  *Research Intern* — *Jul. 2019 – Aug. 2019*
  - Integrated a Motion Planning framework and experience-based planning in an industrial problem

- **Pandora Robotics Group,** http://pandora.ee.auth.gr/ — Aristotle University, Thessaloníki
  *Software Engineer and Tester* — *Sep. 2013 – Feb. 2015*
  - Worked on robot mapping and online diagnostic testers

## Awards, Nominations and Fellowships

- **Future Faculty Fellowship from Rice University** — Rice University, Houston
  *Awarded to Ph.D./Postoctoral students applying to tenure-track positions* — *Sept. 2022*

- **ICRA 2021 Best Paper Top-4 Finalist in Cognitive Robotics** — Rice University, Houston
  *Nomination of relevant papers in a competitive basis* — *Jun. 2021*

- **NSF Graduate Research Fellowship** — Rice University, Houston
  *Awarded to outstanding graduate students in the US in STEM* — *May. 2019*

- **ICRA 2019 Travel Grant** — Rice University, Houston
  *Awarded to attendees in a competitive basis* — *Mar. 2019*

- **Hellenic Professional Society of Texas Scholarship** — Rice University, Houston
  *Awarded to students with Greek Origins for Academic Excellence* — *Jan. 2018*

## Open Source Software

- **MotionBenchMaker** — https://github.com/KavrakiLab/motion_bench_maker
  *Core Developer/Maintainer* — *January 2022 – present*

- **Pyre Library** — https://github.com/KavrakiLab/pyre
  *Core Developer/Maintainer* — *April 2021 – present*

- **Robowflex Library** — https://github.com/KavrakiLab/robowflex
  *Core Contributor* — *March 2019 – present*

- **The Open Motion Planning Library (OMPL)** — http://ompl.kavrakilab.org/
  *Contributor* — *Jul. 2019 – present*

## Teaching Experience

- **Motion Planning (RBE577)** — WPI, Worcester
  *Main Instructor* — *Aug.2023 - Dec.2023*

- **Algorithmic Robotics (COMP 450/550)** — Rice University, Houston
  *Guest Lecturer* — *Nov. 2022*

- **Graduate Seminar (COMP 600)** — Rice University, Houston
  *Instructor Assistant* — *Sept 2022*

- **Algorithmic Robotics (COMP 450/550)** — Rice University, Houston
  *Guest Lecturer* — *Nov. 2021*

- **Artificial Intelligence (COMP 440/557)** — Rice University, Houston
  *Teaching Assistant* — *Aug. 2019 – Dec. 2019*

- **Probabilistic Algorithms and Data Structures (COMP 480/580)** — Rice University, Houston
  *Teaching Assistant* — *Jan. 2019 – May 2019*

- **Algorithmic Robotics (COMP 450/550)** — Rice University, Houston
  *Teaching Assistant* — *Aug. 2018 – Dec. 2018*

- **Rice DataScience Bootcamp** — Rice University, Houston
  *Teaching Assistant* — *Aug. 2018*

- **Statistical Machine Learning (COMP 440/540)** — Rice University, Houston
  *Teaching Assistant* — *Jan. 2018 – May. 2018*

## Service

**Reviewer:** *IROS, ICRA, RAL, TMECH, TRO, RSS*

**Invited Talks:** TU Berlin 2022, *IEEE* RAS School 2022, Workshop at *IROS* 2022, *ECESCON* 2024, Auth 2024

**Organized Workshops:** "Evaluating Motion Planning Performance ", *IROS* 2022

## Skills/Other

**Software:** ROS, Keras, Tensorflow, OMPL, MoveIt

**Programming:** C/C++(Expert), Python(Expert), Java(Intermediate), MATLAB(Intermediate)

**Languages:** Greek(Mother Tongue), English(Excellent), German(Good)

**Social:** Officer of Rice University's CS-GSA, Graduate Wellbeing Peer

## Publications

[1] Z. Zhong, Z. Li, and <u>C. Chamzas</u> "Efficient Computation of Global Redundancy Resolution Maps for Smooth Task Space Motion", *IEEE/RSJ International Conference on Intelligent Robots and Systems, (IROS)*, 2024 [Submitted].

[2] A. Orthey, <u>C. Chamzas</u> and L. E. Kavraki "Sampling-Based Motion Planning: A Comparative Review", *Annual Review of Control, Robotics, and Autonomous Systems*, 2024

[3] <u>C. Chamzas</u>*, M. Lippi*, M. C. Welle*, A. Varava, L. E. Kavraki, D. Kragic "Comparing Reconstruction-and Contrastive-based Models for Visual Task Planning", *IEEE/RSJ International Conference on Intelligent Robots and Systems, (IROS)*, 2022.

[4] Y. Lee, <u>C. Chamzas</u>, and L. E. Kavraki "Adaptive Experience Sampling for Motion Planning using the Generator-Critic Framework", *IEEE Robotics and Automation Letters (RAL), 2022.*

[5] <u>C. Chamzas</u>*, F. Eweje* , L. E. Kavraki, E. L. Chaikof "Human Helath and Equity in an Age of Robotics and Intelligent Machines", *National Academy of Medicine Perspectives*, 2022.

[6] <u>C. Chamzas</u>, A. Cullen , A. Shrivastava, L. E. Kavraki "Learning to Retrieve Relevant Experience for Motion Planning", *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.

[7] C.Quintero-Peña*, <u>C. Chamzas</u>*, Z. Sun, V. Unhelkar, L. E. Kavraki "Human-Guided Motion Planning in Partially Observable Environments", *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.

[8] <u>C. Chamzas</u>, C. Quintero-Peña, Z. Kingston, A. Orthey, D. Rakita, M. Gleicher, M. Toussaint, L. E. Kavraki "MotionBenchMaker: A tool to Generate and Benchamark Motion Planning Datasets", *IEEE Robotics and Automation Letters (RAL)*, 2022.

[9] M. Moll, <u>C. Chamzas</u>, Z. Kingston , L. E. Kavraki "HyperPlan: A Framework for Motion Planning Algorithm Selection and Parameter Optimization", *In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021.

[10] Z.Kingston, <u>C. Chamzas</u>, L. E. Kavraki "Using Experience to Improve Constrainted Planning on Foliations for Multi-Modal Problems", *In IEEE/RSJ International Conference on Intelligent Robots and Systems(IROS)*, 2021.

[11] <u>C. Chamzas</u>, Z. Kingston, C.Quintero-Peña, A. Shrivastava, L. E. Kavraki "Learning sampling distributions using local 3D workspace decompositions for motion planning in high dimensions", *IEEE International Conference on Robotics and Automation (ICRA)*, 2021. **Top-4 finalist for best paper in Cognitive Robotics**

[12] C. Quintero-Peña*, <u>C. Chamzas</u>*, V.Unhelkar, L.E.Kavraki "Motion Planning via Bayesian Learning in the Dark", *In ICRA2021: Workshop on Machine Learning for Motion Planning*, 2021.

[13] E. Pairet, <u>C. Chamzas</u>, Y. Petillot, L. E. Kavraki "Path Planning for Manipulation using Experience-driven Random Trees", *IEEE Robotics and Automation Letters (RAL)*, 2021.

[14] D. Chamzas, <u>C. Chamzas</u>, K. Moustakas "cMinMax: A Fast Algorithm to Find the Corners in an N-dimensional Convex Polytope", *International Conference on Computer Graphics Theory and Applications (GRAPP)*, 2021.

[15] <u>C. Chamzas</u>*, M. Lippi* , M. C. Welle*, A.Varava, A.Marino, D. Kragic, L.E.Kavraki "Structuring Latent Representation with Minimal Supervision for Robotic Tasks ", *3rd Robot Learning Workshop in NeurIPS*, 2020.

[16] <u>C. Chamzas</u>, A. Shrivastava, L. E. Kavraki "Using Local Experiences for Global Motion Planning", *IEEE International Conference on Robotics and Automation (ICRA)*, 2019.