# Thomas Dagès

Haifa, Israel
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## EDUCATION

**Technion, Faculty of Computer Science** **2020 – Today**
*PhD candidate - Towards Neural Network Interpretability* *Haifa, Israel*
Advisors: Alfred Bruckstein and Michael Lindenbaum

**Technion, Faculty of Computer Science** **2017 – 2019**
*MSc - Spatio-Temporal Salient Detection of Moving Objects in Highly Degraded Video Data* *Haifa, Israel*
Advisors: Alfred Bruckstein and Michael Lindenbaum

**École Polytechnique** **2014 – 2017**
*Engineering degree (MSc equivalent) specialised in Mathematics and Computer Science* *Palaiseau, France*

**Lycée Louis-Le-Grand** **2012 – 2014**
*Intensive preparatory classes for competitive entrance examinations to the French Grandes Écoles* *Paris, France*

## PUBLICATIONS

- Amit Bracha*, **Thomas Dagès***, and Ron Kimmel. "Wormhole Loss for Partial Shape Matching", *preprint currently unavailable* (2024), *under review.*
- **Thomas Dagès**, Michael Lindenbaum, and Alfred M. Bruckstein. "Metric Convolutions: A Unifying Theory to Adaptive Convolutions", *arXiv preprint arXiv:2406.05400* (2024), *under review.*
- Simon Weber*, **Thomas Dagès***, Maolin Gao, and Daneil Cremers. "Finsler Laplace-Beltrami Operator for Shape Correspondence", *Computer Vision and Pattern Recognition (CVPR) conference* (2024).
- Amit Bracha, **Thomas Dagès**, and Ron Kimmel. "On Partial Shape Correspondence and Functional Maps", *arXiv preprint arXiv:2310.14692* (2024), *under review.*
- **Thomas Dagès**, Michael Lindenbaum, and Alfred M. Bruckstein. "From Compass and Ruler to Convolution and Nonlinearity: On the Surprising Difficulty of Understanding a Simple CNN Solving a Simple Geometric Estimation Task", *arXiv preprint arXiv:2303.06638* (2023), *under review.*
- **Thomas Dagès**, Laurent D. Cohen, and Alfred M. Bruckstein. "A Model is Worth Tens of Thousands of Examples." *Scale Space and Variational Methods in Computer Vision (SSVM) conference* (2023).
- **Thomas Dagès** and Alfred M. Bruckstein. "Doubly Stochastic Pairwise Interactions for Agreement and Alignment." *SIAM Journal on Applied Mathematics 82.4* (2022): *1246-1266.*
- Ariel Barel, **Thomas Dagès**, Rotem Manor, and Alfred M. Bruckstein. "Probabilistic gathering of agents with simple sensors." *SIAM Journal on Applied Mathematics 81.2* (2021): *620-640.*
- **Thomas Dagès** and Alfred M. Bruckstein. "A Bound on the Edge-Flipping Distance between Triangulations (Revisiting the Proof)." *arXiv preprint arXiv:2106.14408* (2021).
- **Thomas Dagès**, Michael Lindenbaum, and Alfred M. Bruckstein. "Seeing Things in Random-Dot Videos." *MSc Thesis. Computer Science Department, Technion* (2020).
- **Thomas Dagès**, Michael Lindenbaum, and Alfred M. Bruckstein. "Seeing Things in Random-Dot Videos." *Asian Conference on Pattern Recognition. Springer, Cham* (2019).

## SUPERVISION EXPERIENCE

**Automated Saffron Detection and Extraction for a Factory Line** **2021 - Today**
- Undergraduate and MSc project.

**Wormhole Multi-Dimensional Scaling** **2024 - Today**
- MSc project.

## TEACHING EXPERIENCE

**236201 - Introduction to Data Processing and Representation** **2021 - Today**
- Head Teaching Assistant.
- Creating and teaching entirely new material, homeworks, and exams and correcting the latter.

**236200 - Signal, Image, and Data Processing** **2019 - 2021**
- Cohead Teaching Assistant.
- Teaching with mostly existing material, creating and correcting new homeworks and exams.

**236861 - Geometric Computer Vision** **2019**
- Homework Checker.

## RESEARCH SIDE PROJECTS

**Technion** **2018**
*Student Research Project* *Haifa, Israel*
- Created a state-of-the-art astronomical image deblurring algorithm by applying an approach using sparse representations.

**École Polytechnique – Université Paris Descartes** **2016 – 2017**
*Student Research Project* *Palaiseau, France*
- Created and implemented an emotion detector on human faces with a webcam by using the active shape model and fuzzy logic.

**Dassault systèmes** **2017**
*Research Intern* *Vélizy, France*
- In the context of 3D city modelling based on ground photographies, created and implemented an occlusion and reflection remover on the reconstructed texture with automatic detection and inpainting.

**Renault Technologies Romania** **2016**
*Computer-Aided Engineering Intern* *Bucharest, Romania*
- Numerically modelled and simulated the problems of exaggerated opening and closing of a car bonnet maintained by a prop rod, for replacing the costly hydraulic cylinders on the Renault Kaptur.

## RESEARCH INTERESTS

- Computer Vision
- Signal and Image Processing
- Image Analysis
- Modelling Human Vision
- Classical Machine Learning
- Interpretable Artificial Intelligence
- Abstract and Applied Mathematics
- Planar and Differential Geometry
- Statistics
- Applied Computer Science

## LANGUAGES

**Computer:** Python, Matlab, C++, Java, OCaml
**Human:** English (bilingual), French (bilingual), German (intermediate), Russian (beginner), Hebrew (beginner)

## EXTRACURRICULAR

- Sports, often with a group: horse riding, bouldering, surfing.
- Thought provoking Sci-fi reading/viewing and discussions.
- Soothing manual activities like baking, calligraphy, and letter sealing.
- Unplugging through gaming and outings with friends.