# Carlota Soler Arasanz

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## Work Experience

- **VirtaMed** — Zürich, Switzerland
  *Research Engineer* — *Nov 2017 - Present*
  - Developed a novel real-time simulation method for soft rods, improving realism via varied materials and plastic deformation 🎞.
  - Led investigation into real-time suture-soft body contact in computer graphics 🎞.
  - Integrated published rod simulation method into framework, developing features used across multiple shipped products 🎞 🎞.
  - Developed core systems in C++ and C# using proprietary ECS architecture, underpinning Unity's physics engines.
  - Supervised Machine Learning thesis classifying surgical steps using JIGSAWS dataset, comparing CNN and kNN approaches using kinematic data.

- **Eidgenössische Technische Hochschule Zürich (ETHZ), SFINA** — Zürich, Switzerland
  *Student Assistant* — *Nov 2016 - Aug 2017*
  - Developed Web Front-End using WordPress, CSS and HTML.

- **École Polytechnique Fédérale de Lausanne (EPFL), LTS5** — Lausanne, Switzerland
  *Research Intern* — *Feb 2015 - Jul 2015*
  - Processed biomedical images (Diffusion MRI) in Matlab.

- **everis** — Barcelona, Spain
  *IT Consulting Intern* — *Feb 2014 - Jul 2014*
  - Automated website testing using Java.

## Education

- **Eidgenössische Technische Hochschule Zürich (ETHZ)** — Zürich, Switzerland
  *Master of Science in Computer Science* — *Sep 2015 - Sep 2017*
  - **Specialisation**: Computer Graphics and Computer Vision.
  - **Master Thesis**: *Cosserat Rods with Projective Dynamics* (collaboration with VirtaMed).

- **Universitat Politècnica de Catalunya (UPC)** — Barcelona, Spain
  *Bachelor of Science in Telecommunications* — *Sep 2010 - Jan 2015*
  - **Specialisation**: Audiovisual signal processing: Image, Video and Speech.
  - **Bachelor Thesis**: *Convert Kinect-captured 3D facial point clouds into blendshapes* (collaboration with EPFL).

## Publications

- **ACM SIGGRAPH/EUROGRAPHICS Symposium on Computer Animation** — 2018
  *Cosserat Rods with Projective Dynamics.* Carlota Soler, Tobias Martin, Olga Sorkine-Hornung 🎞
  - Developed Cosserat constraints for Projective Dynamics solver.
  - Simulated twisting and bending accurately based on material properties.

## Technologies

- **Programming Languages:** C++, C#, C, Python, Java, HTML, CSS, SQL
- **Frameworks:** Unity, Monogame, OpenCV, OpenGL, TensorFlow
- **Tools:** Matlab, Octave, Blender, Git

## Achievements and interests

- **Talk:** Presented VirtaMed work at Google during Latinx Heritage Month (Oct 2023).
- **Patent pending**: *Methods for realistic and efficient simulation of moving objects* (Filed: May 2022).
- **Awards:**
  - 1st place at Hack'n'Lead: Karma Gigs, Women++ challenge (Sep 2019).
  - 1st place at Game Programming Laboratory: Rot it!, jury award by Studio Gobo (Sep 2016).
- **Other:**
  - Scrum Master for VirtaMed Research team (2022-2024).
  - Conducted ML workshops at VirtaMed with hands-on experience in TensorFlow (2023).
  - Provided private tutoring in scientific subjects to primary and high school students (2011-2014).
- **Interests**: Watersports, skiing, dancing, oil painting, pottery.

## Academic Projects

- ETHZ Projects
  - **Rot It!**
    - Multi-player game in C# using Monogame.
    - Developed unique stain generation and score computation (2016).
  - **Render Implementation**
    - Developed a C++ render with subsurface scattering and depth of field features (2015).
  - **Jenga Tower Simulation**
    - Created custom rigid-body physics for an interactive Jenga tower in Unity (2015).

## Languages

Spanish (native), Catalan (native), English (C1), German (B2), French (B1)