

# Leon Santen<sup>they he</sup>

currently in Oakland, California

born in Frankfurt, Germany

sustainability engineer • roboticist • complex systems thinker

*co-creating life-affirmative climate change solutions*

## Education

### B.S. Engineering: Robotics: Olin College of Engineering

May 2021

#1 or #2 of most innovative engineering institutions worldwide (MIT-study): GPA: 3.76

### M.S. Engineering, Sustainability, and Health (MESH): University of San Diego

May 2024

A radically innovative program, preparing sustainable engineers to make informed choices in the fields of water-, energy-, waste-, food-, health-, and just human systems, all applied to self-directed real-world projects.

## Experience

### Getting a 50 kW vertical wind turbine market ready with the *Just Energy Hub*

During my master's program, I explored the feasibility of deploying a vertical axis wind turbine in off-the-grid & disaster relief settings. I worked as a designer with Olin College students to envision applications for the wind turbine and guided industrial engineering students from the California Polytechnic State University during their capstone for an ethical supply chain design.

Sept 2022 - Nov 2023

Advisory board member  
and partnership



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for more info

### Fish-safe water turbine design and fish injury research

As part of Natel Energy's engineering team, I helped to design water turbines that allow fish to pass through the runner and drastically reduce eco-system damage. My work ranged from cavitation test design & pneumatic system design to conducting scientific studies to investigate the impact of turbine passage on fish. With my help as a data analyst & illustrator, we published a milestone fish-passage study that has helped Natel Energy to establish their reputation as the first fish-safe turbine designers.

July 2021 - May 2022

Internship



### Off-the-grid battery system protection, pan-tilt mechanisms for solar panels, siting study and design for a Savonius turbine...

During COVID, I collaborated with a farm in North Carolina to host 15 engineering students to live in community and gain experience building off-the-grid systems with a direct human impact. My proudest creations were a large-scale pan-tilt mechanisms for a five solar-panel array and the creation of a wireless system that monitored & controlled the battery system health by switching off heavy appliances and giving visual feedback to the community. I also ran a siting study for a 4 kW vertical wind turbine and prototyped its blade design.

Aug 2020 - May 2021

Community  
project



### Duodenoscope valve redesign at Boston Scientific

During this two semester long project, we redesigned the internal valve system of a medical device used for endoscopy procedures. We started our process with an extensive overview of all valve types. Then, we creatively prototyped many valves with 3D resin printing and iterated on our designs many times. Flow performance, haptic feedback, intuitive use, and manufacturability were in the center of our design process. Not to brag, but I came up with the final mechanism that went into patenting.

Aug. 2020 - May 2021

Bachelor's  
capstone



### Ground Robotics Autonomous Vehicle Lab - Autonomous Tractor

I developed a ROS-integrated, ultrasonic sensor system that senses the amount of accumulated dirt in the tractor's box blade. When the tractor accumulated too much dirt in its box blade, it lifted the bucket to prevent stalling. This system allowed an uninterrupted flow of its autonomous task to even out hills.

2019 - 2020

Project group

### Off-road vehicle suspension design - BAJA

As a member of a 25 person team, I designed the upper and lower suspension A-arms of an off-road vehicle. My FEA-based design worked perfectly during two off-road vehicle competitions. I further designed and fabricated the driver's seat with composite molding.

2018 - 2019

Project group

### Fabrication internship - SCHÜTZ GmbH, Germany

I learned and participated in all manufacturing processes for IBC-totes (large plastic containers for liquids): injection molding, CNC milling/lathing, machine construction, CAD, blow-stretch molding, and welding. I took away many insights regarding communication between workers & engineers.

May 2017

Internship



staying in touch...  
**Leon Santen** they  
he



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**LinkedIn**

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## My technical and engineering skills:

- Python, C++, R
- SolidWorks, CATIA, FEA
- Electrical prototyping & design
- Working with ecosystems and complex living systems
- MATLAB, Simulink, Mathematica, ROS
- CNC Mill, CNC Lathe, MIG Welding, 3D-Printing
- Graphic design (Illustrator, Photoshop)
- Scientific study design
- Participatory research & design

## Skills that are a big part of who I am:

- Always working toward deeper co-operation and knowledge sharing
- Illustrating, drawing, sharing ideas visually
- Woodworking
- DJing, sound healing, cello
- Massage therapy
- Community work, co-creative art
- Dancing
- Baking

## My unique strengths as a team member:

