

## Asset Description

RobotH is a telemedicine system that enables remote ultrasound examinations, eliminating the need for physical proximity. The system consists of two robotized ergonomic stations that communicate via the internet: one for the patient and one for the physician. The patient's station **includes a set of ultrasound probes with standard functionalities**. The physician's station **includes a robotized haptic feedback interface**, enabling the expert to remotely operate the robot while experiencing the force exerted on the patient. **This innovative system allows physicians to perform remote ultrasound examinations safely and efficiently.**



At the current stage, RobotH is being used as:

- Telemedicine tool allowing the interaction of multiple physicians and patients, mitigating the shortcomings of traveling from both patient and physician sides, and creating new services such as technical tele-mentoring, and international collaboration.
- Training tool that allows distance learning of ultrasound techniques through co-manipulation of an ultrasound probe while the learner and mentor are interacting at a distance. The target audience will be clinicians and healthcare professionals that want to acquire new skills in diagnostic ultrasounds or improve their current skills.



## Technical Specification

Hardware	Robot arm with 6 DoF	Patient Station
	Interchangeable Probe: INTERSON GP-C01 Curved Ultrasound Probe	
	3 adjustable 1080p cameras	
	Teleconference system	
	Haptic device also with 6-DoF	Physician Station
	Touchscreen	
Power Consumption	~300W peak	Patient Station
	~200W peak	Physician Station
Network	Ethernet, Wi-Fi, 5G	
	Minimum required latency and jitter: 30±10 ms or 60±2ms	
Security	Encrypted and anonymized data through VPN	
	HL7 protocol, DICOM standard	
Safety	Maximum force: 10N Vertical Axis 5N on the Horizontal Axis	
	Maximum speed: 0.5 m/s	
	Torque and speed limits	
	Robot mass concentrated at the robot's base	

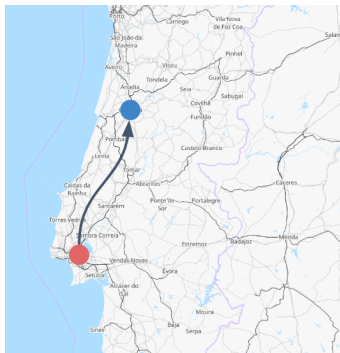
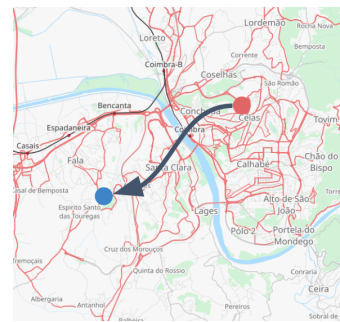

## Success Stories - Evaluation by Experts

The table below lists several real-world instances where the system has been successfully deployed and evaluated by leading experts in the field of telemedicine.

Location	Country
Chicago (RSNA Anual Meeting)	USA
São Paulo (Radiology Meeting)	Brazil
<b>São João Hospital (Porto), Coimbra’s University Hospital (Coimbra), Luz Hospital (Lisbon), São Francisco Xavier Hospital (Lisbon), São José Hospital (Lisbon), etc</b>	Portugal
Trinity College Dublin	Ireland
Karolinska Institutet	Sweden
University of Lodz	Poland
Sorbonne Université	France

## Success Stories - Remote Tele-Operation

The table below lists tests that enabled physicians to conduct remote ultrasound examinations with the same precision and safety as in-person procedures, underscoring the system's efficiency, reliability, and transformative impact on healthcare delivery.

Map	Physician Station Location	Patient Station Location	Network
	NOS Telecomunicações - <b>Lisbon, Portugal</b>	Instituto Pedro Nunes - <b>Coimbra, Portugal</b>	<b>5G</b>
	Coimbra's University Hospital - <b>Coimbra, Portugal</b>	Covões Hospital - <b>Coimbra, Portugal</b>	<b>Cabled Internet</b>
	Tecnalia - <b>Bilbao, Spain</b>	Instituto Pedro Nunes - <b>Coimbra, Portugal</b>	<b>Cabled Internet</b>