Horizon 2020

Project title: AuTonomous intraLuminAl Surgery

Advertisement of Vacancies

Deliverable number: D6.2

Version 1.0.0

Funded by the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie Grant Agreement No. 813782

Project Acronym: ATLAS

Project Full Title: AuTonomous intraLuminAl Surgery

Call: H2020-MSCA-ITN-2018

Grant Number: 813782

Project URL: https://atlas-itn.eu

Deliverable nature:	Demonstrator (D)
Dissemination level:	Public (PU)
Contractual Delivery Date:	April 30, 2019
Actual Delivery Date	June 13, 2019
Number of pages:	22
Keywords:	Hiring, Advertisement
Authors:	Gianni Borghesan, KUL
Peer review:	Emmanuel Vander Poorten, KUL

Abstract

This document reports the advertisement activities organised at the beginning of the recruitment phase, to make publicity of the project vacancies and reach out to a broad audience of possible ESR candidates.

Announcements have been done mainly using electronic advertising, and through direct advertising during the presentation given at international scientific meetings.

This is a demonstrator deliverable, the associated report (this text) merely provides some background information on how this was conducted, *e.g.* by screenshots of the atlas website, an overview of the internet traffic and list of the direct dissemination activities.

The effect of these activities (namely the recruitment) is not reported in this deliverable as it forms the topic of deliverable D6.3.

Contents

List of Figures

1 Advertisement on Websites and Social Media

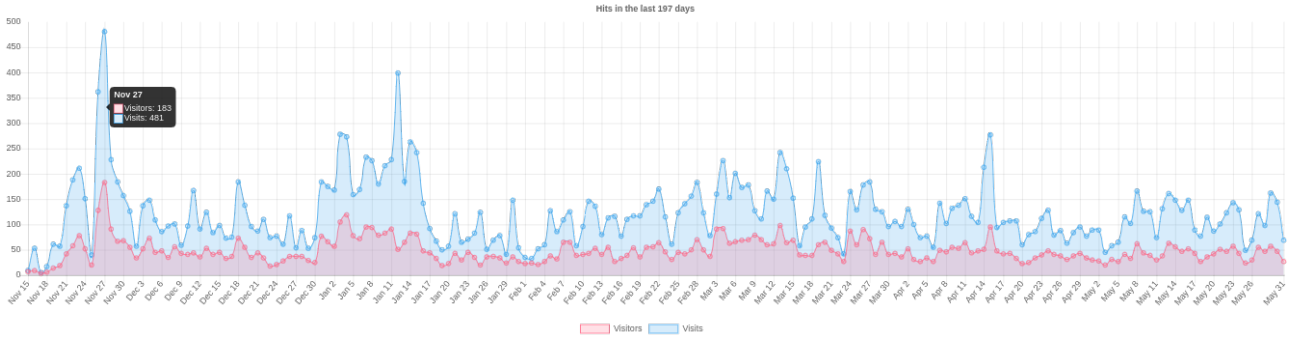
All the vacancies have been advertised (from mid-November on) via the two most important mailing lists in robotics, *EU robotics* and *robotics-worldwide*, multiple times. These posts, as well as all the other announcement channels, referred to the *ATLAS* web page https://atlas-itn.eu as initial starting point to discover the scope of the project and how to apply to ESRs vacancies. The relevant pages are annexed in Chapter 3.

The submissions has been managed via the *KU Leuven job* website[1]. The KU Leuven system automatically republishes all the posted vacancies on the Euraxess website[2]; see for example the advertisement of ESR 8 reported in Chapter 3, page 12.

Notifications about the open positions have been posted on social media (Twitter, Facebook, and Linkedin) using personal and institutional accounts. In addition, a well-known blog in surgical robotics, *surgrob*, guested a post[3] about the *ATLAS* project. The post is included at page 20.

The *ATLAS* website visit counter reports 24.503 visits and 9.753 single visitors as counted the 31st of May, distributed as shown in Figure 1.1.

Figure 1.1: *ATLAS* website daily visits and visitors.



[1] https://www.kuleuven.be/personeel/jobsite/jobs/staff?hl=en&lang=en
[2] https://euraxess.ec.europa.eu/
[3] http://surgrob.blogspot.com/2019/03/more-on-atlas-project.html

2 Advertisement on Scientific Conferences, Courses, and Visits

In addition, advertisement of the project and of the vacancies has been done during oral presentations, informal activities, lab visits, and classes:

- during the workshop *Next Generation Surgery: Seamless integration of Robotics, Machine Learning and Knowledge Representation within the operating rooms*[1], workshop at ICRA (May 24, 2019) during the presentation of Gianni Borghesan.
- during the workshop *Machine Intelligence for Automation within Operating Rooms* during ERF2019 in Bucharest, Romania, on 20-22 March. Slides are available online[2] on the atlas website.
- during the connected events 2019 International Symposium on Medical Robotics (ISMR) and the Spring School on Medical Robotics (SSMR) , the vacancies have been published on the website[3] and many candidates had the opportunity to contact KUL and UNIVR supervisors that were present during the conference and school.
- All professors make aware their student following last-year classes of the possibility to pursue a PhD in the framework of the *ATLAS* project.
- about 70 Master Students of Biomedical Engineering (Pisa University) have been approached during some visits at the BioRobotics Institute and *ATLAS* flyers have been distributed in the period between October 2018 and March 2019;
- about 30 Master Students of Bionics Engineering have been approached during several courses held at the BioRobotics Institute between April 2018 and May 2019.

[1] https://nxgsur-icra2019.sciencesconf.org/
[2] https://atlas-itn.eu/wp-content/uploads/Presentations/ATLAS_intro.pdf
[3] http://ismr.gatech.edu/ATLAS%20-%20ERS%202019

3 Website and Social Media Screen-Shots

Screen-shots of web pages and social media related to hiring are annexed in this chapter:
page 5 *ATLAS* website page with vacancies description,
page 10 *ATLAS* website page with the description of the application procedure,
page 12 euraxess vacancy announcement, for ESR 8,
page 15 vacancies announcement on institutional website of SSSA (in Italian),
page 17 vacancies announcement on institutional website of TU Delft,
page 19 vacancies announcement on institutional website of UINSTRA (in French),
page 20 the post hosted by the SURGROB blog, and lastly
page 22 screenshots of advertisements via social media.
The reported pages are taken the 6th of June.

ATLAS

Home | We Are Hiring! | Project Description | About Us | Dissemination | News & Events | Contact Us

Vacancies

ATLAS is looking for outstanding candidates to fill in 15 Early Stage Researcher positions.

Please note that some of the vacancies will be closed the **15 Jan 2019**, while others will be closed the **15 April 2019 (see how to apply)**. Therefore, candidatures to the last closing session will be evaluated in June.

ESR 3 has been re-opened. New deadline: 7th of March.

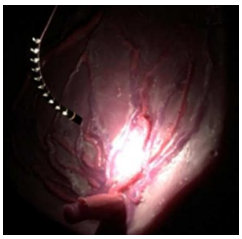
The proposed vacancies are Joint Doctorates. This means that part of the PhD will be hosted at the Main Institution, while part will be hosted at the Secondary Institution (a period between 6 month and 1 year).

The ESR will have the opportunity to achieve a double or joint PhD degree, fulfilling the requirements of both institutions.

Each ESR project foresees one or more secondments to relevant companies or research centre, not necessary in the same country of Primary or Secondary Institutions. Candidate mobility, as well as motivation, is a requirement.

ESR 1

Development of ultra-thin multi-steerable catheter technology suited for soft-robotic navigation through complex vascular structures



Combining experience on intuitive human-machine interfaces (HMIs) for MIS with know-how on the development of mechanical hand-held steerable catheters for complex interventions in the heart, ESR1 will push the current technology frontiers further by developing a new class of multi-steerable catheters controlled by electro-mechanical soft-robotic actuators. The research will have two main goals:

- to combine soft-robotic actuation with advanced steering technology inspired by clever design principles from nature (octopus, wasp) to develop novel ultrathin multi-steerable catheters for navigation through complex lumens.
- to include knowledge on human depth perception and eye-hand coordination, to optimize HMIs to allow intuitive control overthe multi-steerable catheters designs from 3D control actions and 2D CT/MRI images.

Collaborating with clinical experts, the soft-robotic catheter technology will enable complex vascular interventions (e.g. treatment of chronic total occlusions) or stress-free passage through narrow ureter. Cases which are hard to carry out with existing technology. The catheters will be evaluated ex-vivo in accurate anatomic 3D-printed lumen models.

Main institution and supervisor: *TU Delft, P. Breedveld*

Secondary institution and supervisor: *KU Leuven, E. Vander Poorten*

Selection closed: shortlisted candidates (by applicant number)

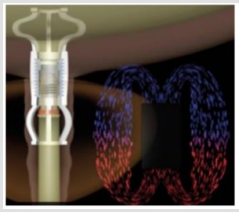
54985160
54076668
54983622

Final ranking:

1) 54985160

ESR 2

Magnetic driving and actuation



When dealing with soft, miniaturized and elongated instruments for endoluminal and transluminal applications, actuation technologies are limited. On board actuators are difficult to miniaturize and to integrate, possibly leading to safety issues. Tendon drive systems suffer from friction and they often require very large external actuators. Wireless driving solutions based on magnetic dragging, triggering or anchoring are for these reasons considered extremely promising.

ESR 2 will analyse in which districts magnetic actuation can be feasible, it will seek to determine optimal strategies and combinations of hybrid actuation schemes for each target anatomy. Based on patient-specific images, the scaling of magnetic forces and torques can be more or less favourable.

In addition, the ESR will explore different magnetic sources, based on permanent magnets and electromagnetic solutions. A taxonomy of magnetic mechanisms for triggering, dragging and anchoring will be prepared. Such can be extremely useful for the different surgical scenarios.

Main institution and supervisor: *SSSA, A. Menciassi*

Secondary institution and supervisor: *KU Leuven, E. Vander Poorten*

Selection closed: shortlisted candidates (by applicant number)

54971388
54963532
54985163

Final Ranking:

1) 54971388
2) 54985163

Selected candidate: 54971388 - Hasan Dad Ansari Mohammad

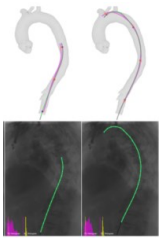
ESR 3

Distributed proprioception for safe autonomous catheters

The interaction between flexible instrument bodies and surrounding deformable lumens is intrinsically complex and hard to oversee if not explicitly measured. ESR3 identifies and integrates optimal sensing technology for real-time proprioception along the deformable body.

This project includes real time shape estimation based on optical measurements such as FBGs or relying on electromagnetic (EM) tracking. It explores new sensing methods such as electrical impedance tomography (EIT) or algorithms that estimate the contact location and amplitude of the interaction force based on the acquired shape estimates. Automatic calibration and registration techniques will be developed, so that resulting techniques may be employed 'out of the box' requiring minimal effort and tuning prior to deployment.

Applicants should have a MSc/MEng (or equivalent) in Engineering, Computer Science, Mathematics or related disciplines.



Main institution and supervisor: *KU Leuven, E. Vander Poorten*

Secondary institution and supervisor: *SSSA, A.Menciassi*

ESR 4

Intraluminal sensing for autonomous navigation in remote district

ESR4 analyses and select the most appropriate intraluminal sensing solutions for the different body targets. More specifically, for vascular applications on board sensors such as e.g. force sensors on the catheters' tip and intravascular ultrasound (IVUS) can be combined with external monitoring solutions (e.g. fluoroscopy). For endoluminal and transluminal applications new developments with chip-on-tip devices (e.g. NanEye) or dedicated CCD and CMOS cameras, or use of OCT will be considered.

If needed methods to enhance the visibility can be explored (e.g. employing a transparent silicon-like blob ahead of the camera); accelerometer, gyroscopes and magnetic sensors will be used for understanding the position of the internal instruments as regards an external frame. pH sensors could be used for understanding the position of the device based on the sensed pH in the target area.

All these sensors are geared to provide maximal information about the surroundings that can be fed into algorithms that aim to reconstruct the surroundings realistically.

Main institution and supervisor: *SSSA, A.Menciassi*

Secondary institution and supervisor: *UNISTRA, P. Renaud*

Selection closed: shortlisted candidates (by applicant number)

54971388
54983915
54985163
54957263

Final ranking

1) 54985163
2) 54957263
3) 54971388

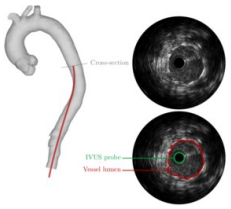
Selected candidate: 54985163 - Sujit Sahu

ESR 5

From local sensing to global lumen reconstruction

This ESR develops techniques to reconstruct vascular lumens from a selection of sensor modalities, including: IVUS, EM, shape and forward looking OCT. Through sensor fusion the methods will be made robust against occlusions, artefacts or disturbances. Machine Learning methods will be adopted to extract relevant anatomic features and establish correspondences. Mosaicking methods are adopted to stitch local features to a global representation. In a 2nd round, the deformation of the lumen (due to physiological processes or interaction with the passing instrument) will be incorporated. This leads to 4D modelling (3D+time). Energy-based methods that minimize the total energy of the combined instrument/vessel structure seem most suitable.

The lumen represented by its centreline will be deformed by local models such as e.g. a cylinder-model fitted through the latest sensor data, the instrument shape or physiologic process models. ESR5 further extracts relevant measures directly from the raw data to provide guidance cues e.g. distance to an anatomic target to be avoided.



Main institution and supervisor: *KU Leuven, J. Vander Sloten*

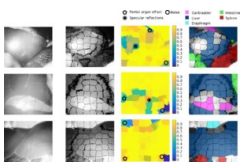
Secondary institution and supervisor: *UNIVR, P. Fiorini*

ESR 6

Computer vision and machine learning for tissue segmentation and localization

Each flexible robot will be equipped with extero- and proprioceptive sensors (such as FBG) in order to have information on position and orientation, as well as on-board miniaturized cameras. Additionally, RT image acquisition will be performed using US sensors externally placed in contact with the patient outer body. In order to track the position of the flexible robot and to simultaneously identify the environment conditions RT US image algorithms will be developed. Deep learning approaches combining Convolutional Neural Networks (CNNs) and automatic classification methods (e.g. SVM) will extract characteristic features from the images to automatically detect the:

1. flexible robot shape



2. the hollow lumen edges positions (to be integrated with ESR5) and
3. information on surrounding soft tissues shape and location.

RT performance will be achieved by parallel optimization loops.

Main institution and supervisor: *POLIMI, E. De Momi*

Secondary institution and supervisor: *UNISTRA, M. de Mathelin*

ESR 7

Simultaneous tissue identification and mapping for autonomous guidance

One of the challenges of autonomous surgical devices is the ability to navigate towards the clinical target. Two aspects have to be addressed to answer that problem.

First of all, targeted disease has to be identified in the organ of interest. Second of all, because the large majority of luminal organs inside of the human body have a very complex geometry, real-time information about position of the device in the lumen is needed. In this project, a side-viewing OCT catheter will be used in conjunction with a robotic endoscope to collect images, which can be used for simultaneous assessment of the clinical status of tissue and recovering of information about the position of the instrument in the lumen.

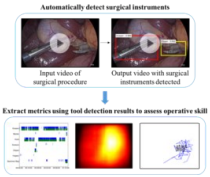
The position mapping can be further improved by combining optical information with robotic measurements. Additional imaging and sensing modalities like electromagnetic tracking or IVUS may also be used.

Main institution and supervisor:*UNISTRA, M. de Mathelin*

Secondary institution and supervisor: *UNIVR, P. Fiorini*

ESR 8

Image-based tool tissue interaction estimation



One of the keys to bring situational awareness to surgical robotics is the automatic recognition of the surgical workflow within the operating room. Indeed, human-machine collaboration requires the understanding of the activities taking place both outside the patient and inside the patient. In this project, we will focus on the modelling and recognition of tool -tissue interactions during surgery.

Based on a database of videos from one type of surgery, we will develop a statistical model to represent the actions performed by the endoscopic tools on the anatomy. We will link this model both to formal procedural knowledge describing the surgery (e.g. an ontology) and to digital signals (such as the endoscopic video) in order to provide information that is human- understandable. Models and measurements coming from the robotic system will also be incorporated, in order to develop semi -supervised on unsupervised methods, thus limiting the need to annotate the endoscopic videos.

Applicants should have a MSc/MEng (or equivalent) in Engineering, Computer Science, Mathematics or related disciplines. Applicants must have strong programming skills and background in Computer Vision and Machine Learning.

Main institution and supervisor: *UNISTRA, N. Padoy*

Secondary institution and supervisor: *POLIMI, G. Ferrigno*

ESR 9

Surgical episode segmentation from multi-modal data

In order to decide which actions to perform, an autonomous robot must be able to reliably recognize the current surgical state or phase it is in . This is especially true in a context of shared autonomy, where part of the procedure is still done by a human operator, or if the robot is to intelligently/semi-automatically assist manual gestures performed by a surgeon. To this end, deep learning methods (e.g. combined CNN for video and RNN for lower dimensionality data) will be applied for extracting the relevant information. The originality of this ESR project is that multi-modal data will be considered: building from previous developments on phase detection in endoscopic video data, the algorithms will be augmented with data coming from intra -operative sensors such as EM trackers, Ultrasound images, pre-operative data. Feature detectors and descriptors will be developed that are able to perform optimal discrimination of different areas of interest and for reducing data dimensions and thus improving the computational performance for intra-operative applications.

Since methods developed in this ESR are trained on multi-modal data, they may be adapted and applied both to intraluminal procedure based on video feedback (i.e. colonoscopy and ureteroscopy) but also to cardiovascular catheterization.

Applicants should have a MSc/MEng (or equivalent) in Engineering, Computer Science, Mathematics or related disciplines. Applicants must have strong programming skills and background in Computer Vision and Machine Learning.

Main institution and supervisor: *UNIVR, D. Dall' Alba*

Secondary institution and supervisor: *UNISTRA, N. Padoy*

ESR 10

Automatic handsfree visualization of a 6 DoF agent within a complex anatomical space

Where ATLAS develops technology to steer flexible instruments through lumens, ESR10 develops an intuitive graphical interface (GUI) to supervise this execution.

- Computer tools for 3D visualization are very powerful allowing visualization from arbitrary viewpoint. However, managing and understanding this viewpoint is tedious and tiresome and aggravated when it concerns a moving/deformable scene. To avoid users needing to continuously manipulate the viewpoint this ESR will develop technology for
  • hands-free automatic visualization of the scene; updates of viewpoint happens following the same rules as an expert;
  • automatically setting local transparencies to reduce viewpoint changes, e.g. which would be done to perceive relative positions, understand contact locations or avoid occlusions. Assumable when initiated by oneself, these changes are difficult to follow if initiated by others. The system must thus adequately guess the operator's visualisation needs.
  • adjusting the view and perspective depending on the tracked path and mapping (SLAM). This calls for an intelligent system that deforms the run path automatically, so that it is always visible. In the case of a bowel exploration, the system would present an unraveled path, but would respect textures and features of the walls, thus always achieving proper visualization independently of the complexity of the trajectory, full of occlusions.

This ESR will work closely with ESR9 as surgical episodes form key inputs for an intelligent visualisation system.

Main institution and supervisor: *UPC, A. Casals*

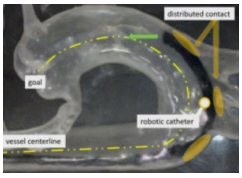
Secondary institution and supervisor: *SSSA, A. Menciassi*

Selection closed: shortlisted candidates (by applicant number)

54977930
53811578
54753782

ESR 11

Control of multi-DOF catheters in an unknown environment



The interaction between a flexible catheter and a deformable lumen is extremely complex as it is affected by slack, friction and a time-varying contact state. ESR11 focuses first on devising controllers for the distal robot part. The problem of deriving a controller that behave robust independent of contact state and actuator limitations (on power and range) is still unsolved.

This will require adjusting the kinematic model to governing contact point/forces which can be estimated by fusion proprioception (ESR3) and RT reconstruction (ESR5, ESR6). Second, to establish a desirable global shape a multi-objective control problems is proposed in order to trade off:

- the amplitude and direction of forces applied on tissue;
- the need to avoid specific areas (e.g. arterial calcification);
- the desire to include suggestions by users e.g. provided via teleoperation or shared control.

Main institution and supervisor: *KU Leuven, E. Vander Poorten*

Secondary institution and supervisor: *TU Delft, J.Dankelman*

ESR 12

Distributed follow-the leader control for minimizing tissue forces during soft-robotic endoscopic locomotion through fragile tubular environment

Using prior experience on developing snake-like instruments for skull base surgery, ESR12 will elaborate these mechanical concepts into advanced soft-robotic endoscopes able to propel themselves forward though fragile tubular anatomic environments to hard-to-reach locations in the body. The ESR has two main goals:

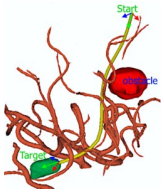
- to use advanced 3D-printing to create novel snake-like endoscopic frame-structures that can be easily printed in one printing step without need for assembly, and that easily integrate cameras, actuators, biopsy channels and glass fibres. FEM-simulations to optimize a) shapes that are easy to bend yet hard to twist and compress (e.g. by using helical shapes), b) minimal distributions of actuators enabling complex and precisely controlled motion.
- to develop follow-the-leader locomotion schemes for moving through fragile tubular environments (e.g. colon or ureter) and evaluate this ex-vivo in anatomic tissue phantoms.

Main institution and supervisor: *TU Delft, J. Dankelman*

Secondary institution and supervisor: *POLIMI, G. Ferrigno*

ESR 13

Path planning and real-time re-planning



Given the deformable nature of the surroundings, RT planning and control is needed in order to guarantee that a flexible robot reaches a target site with a certain desired pose. ESR 13 will implement an accurate kinematic and dynamic model of the flexible robot incorporating knowledge on the robot limitations right in the planning algorithm so that the best paths are executed

1. pre-operatively, considering the constraints on allowable paths, the location of the anatomic target and
2. intra-operatively including the uncertainties in the adopted (and identified) flexible robot model and of the collected sensor readings (ESR5).

Advanced exploration approaches will be adapted to each specific clinical scenario, its constraints as well as the robot constraints such as its manipulability. Specific clinically relevant optimality criteria will be identified and integrated. This methods could try to keep away sharp parts of the instrument (e.g. tip) from lumen edges. RT capabilities will grant the possibility to re-plan the path during the actual operation.

Main institution and supervisor: *POLIMI, E. De Momi*

Secondary institution and supervisor: *TU Delft, J. Dankelman*

ESR 14

Automatic endoscope repositioning with respect to the surgical task

Surgery often involves performing delicate operations with two hands or instruments. Those operations are typically even more difficult when considering MIS done in an intraluminal setting. This is due to the limited controllability of the flexible instruments and to the restricted access to the surgical site. Moreover, humans experience problems in executing complex tasks with flexible multi-arm endoscopes because of the large number of DOFs and the coupling between DOFs. Starting a surgical gesture in an unfavourable position may necessitate an interruption for repositioning, which is not always acceptable clinically.

ESR14 will develop a set of algorithms for intelligent repositioning of the endoscope and its arms in a favourable position. First, the intended gesture is detected using a task model combined with intraluminal sensing. Then, planning and control algorithms are developed to position the system such that the gesture can be optimally performed. While ESR14 aims to develop a semi-automatic robotic repositioning in where robot and operator collaborate. This is a large step towards full autonomy. The main target will be Colonoscopy and Gastroscopy, where robots are usually more complex, but the methods developed will be generic and therefore applicable to other scenarios.

Main institution and supervisor: *UNISTRA, M. de Mathelin*

Secondary institution and supervisor: *KU Leuven, J. de Schutter*

ESR 15

Optimal learning method for autonomous control and navigation

Learning optimal control strategies for autonomous navigation and on-line decision making is a challenging problem. Currently 2 main strategies could be adopted: learning from data acquired during the execution of surgical procedure by expert surgeon or learning by experimentation.

ESR15 will compare motion control strategies for intraluminal navigation learned from expert data with the ones learned in simulated environment. From these results, it will be possible to find the optimal control strategies for different clinical scenarios and considering specific robotic configuration. The trajectory planning methods developed in ESR9 will be used to define an initial trajectory for the autonomous navigation. The performance of the different approaches will be evaluated in a realistic setting (physical phantoms) and in a simulated environment using a set of objective evaluation metrics.

An integrated testing environment, including advanced visualization, will be developed to improve the evaluation and testing of different methods (extending/integrating the results of ESR10). The proposed navigation strategies will be tested in the colonoscopy and ureteroscopy clinical scenarios, but possible extensions to cardiovascular catheterization will be considered.

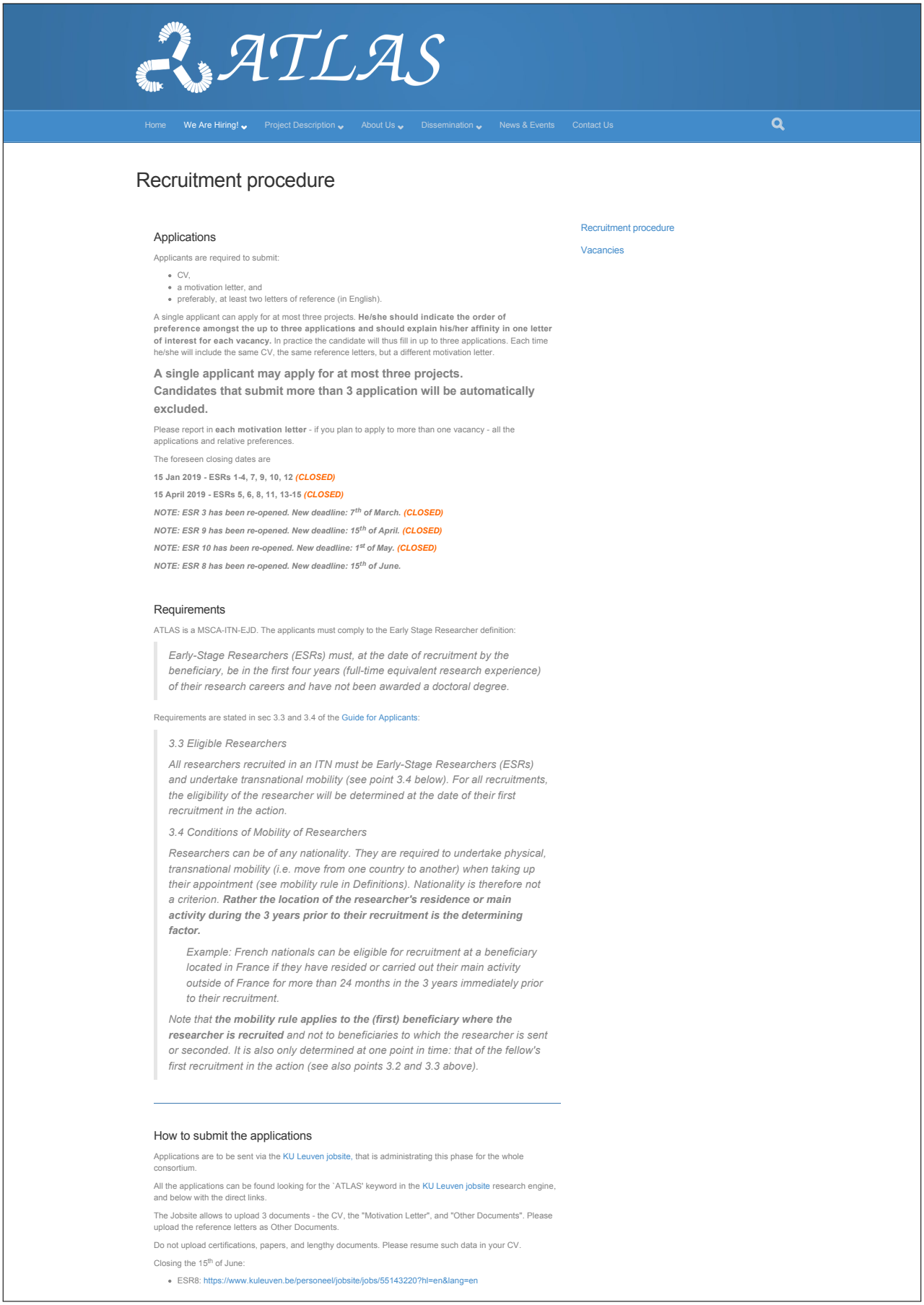
Applicants should have a MSc/MEng (or equivalent) in Engineering, Computer Science, Mathematics or related disciplines. Applicants must have strong programming skills and background in Computer Vision and Machine Learning.

Main institution and supervisor: *UNIVR, P. Fiorini*

Secondary institution and supervisor: *UPC, A. Casals*

Beneficiaries People Partner Organisations

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 813782



ATLAS

Home | We Are Hiring! | Project Description | About Us | Dissemination | News & Events | Contact Us

Recruitment procedure

Recruitment procedure

Vacancies

Applications

Applicants are required to submit:

- CV,
- a motivation letter, and
- preferably, at least two letters of reference (in English).

A single applicant can apply for at most three projects. **He/she should indicate the order of preference amongst the up to three applications and should explain his/her affinity in one letter of interest for each vacancy.** In practice the candidate will thus fill in up to three applications. Each time he/she will include the same CV, the same reference letters, but a different motivation letter.

A single applicant may apply for at most three projects. Candidates that submit more than 3 application will be automatically excluded.

Please report in **each motivation letter** - if you plan to apply to more than one vacancy - all the applications and relative preferences.

The foreseen closing dates are

15 Jan 2019 - ESRs 1-4, 7, 9, 10, 12 ***(CLOSED)***

15 April 2019 - ESRs 5, 6, 8, 11, 13-15 ***(CLOSED)***

NOTE: ESR 3 has been re-opened. New deadline: 7th of March. (CLOSED)

NOTE: ESR 9 has been re-opened. New deadline: 15th of April. (CLOSED)

NOTE: ESR 10 has been re-opened. New deadline: 1st of May. (CLOSED)

NOTE: ESR 8 has been re-opened. New deadline: 15th of June.

Requirements

ATLAS is a MSCA-ITN-EJD. The applicants must comply to the Early Stage Researcher definition:

> *Early-Stage Researchers (ESRs) must, at the date of recruitment by the beneficiary, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree.*

Requirements are stated in sec 3.3 and 3.4 of the Guide for Applicants:

> *3.3 Eligible Researchers*
>
> *All researchers recruited in an ITN must be Early-Stage Researchers (ESRs) and undertake transnational mobility (see point 3.4 below). For all recruitments, the eligibility of the researcher will be determined at the date of their first recruitment in the action.*
>
> *3.4 Conditions of Mobility of Researchers*
>
> *Researchers can be of any nationality. They are required to undertake physical, transnational mobility (i.e. move from one country to another) when taking up their appointment (see mobility rule in Definitions). Nationality is therefore not a criterion.* ***Rather the location of the researcher's residence or main activity during the 3 years prior to their recruitment is the determining factor.***
>
> > *Example: French nationals can be eligible for recruitment at a beneficiary located in France if they have resided or carried out their main activity outside of France for more than 24 months in the 3 years immediately prior to their recruitment.*
>
> *Note that* ***the mobility rule applies to the (first) beneficiary where the researcher is recruited*** *and not to beneficiaries to which the researcher is sent or seconded. It is also only determined at one point in time: that of the fellow's first recruitment in the action (see also points 3.2 and 3.3 above).*

How to submit the applications

Applications are to be sent via the KU Leuven jobsite, that is administrating this phase for the whole consortium.

All the applications can be found looking for the `ATLAS' keyword in the KU Leuven jobsite research engine, and below with the direct links.

The Jobsite allows to upload 3 documents - the CV, the "Motivation Letter", and "Other Documents". Please upload the reference letters as Other Documents.

Do not upload certifications, papers, and lengthy documents. Please resume such data in your CV.

Closing the 15th of June:

- ESR8: https://www.kuleuven.be/personeel/jobsite/jobs/55143220?hl=en&lang=en

Evaluation procedures

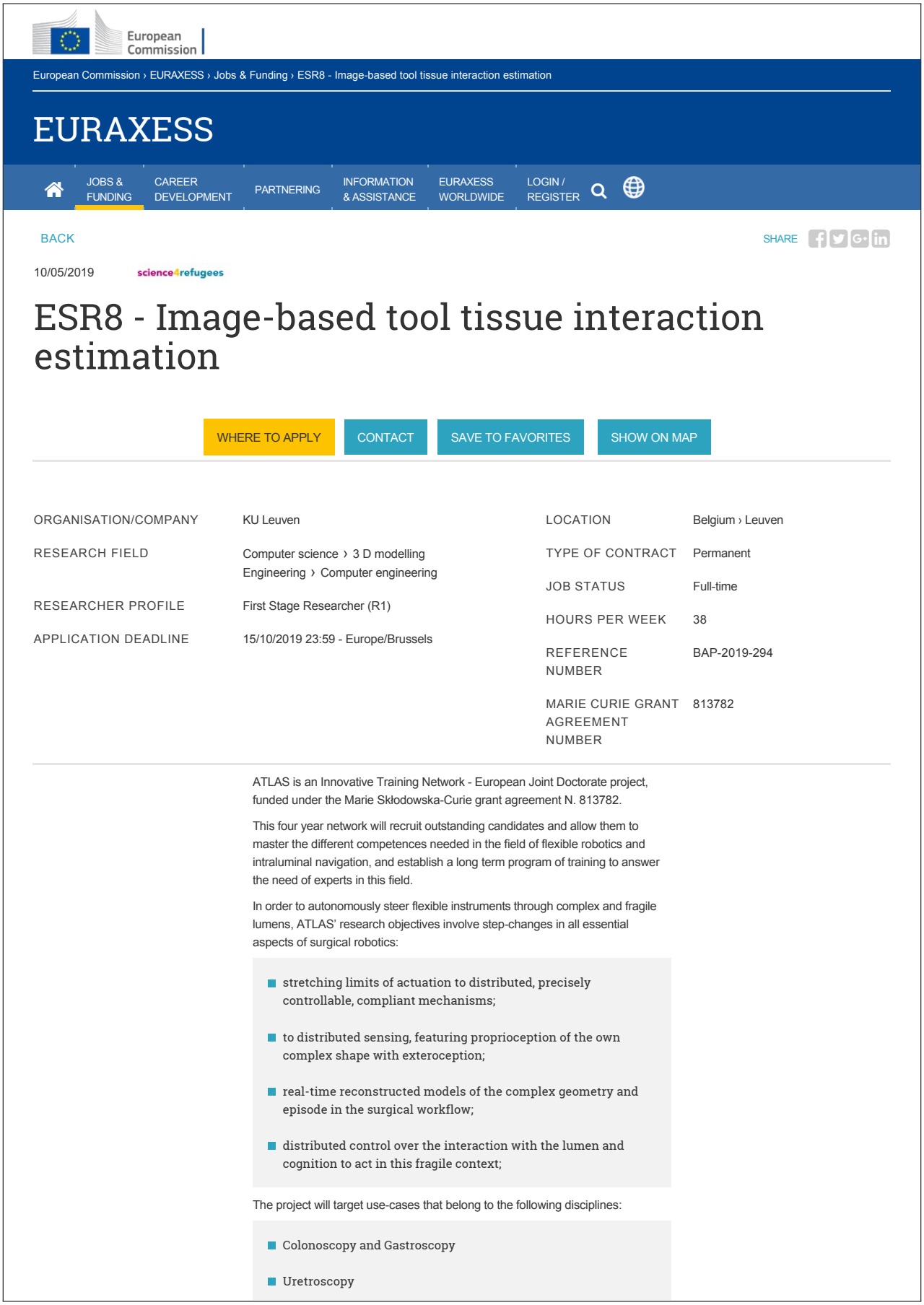
The candidate, once she/he submits his applications via the KU Leuven Job Site, has concluded the necessary steps to access the evaluation process.

After the closing dates a number of committee will start processing all received candidatures. The candidates will be evaluated collegially by the project beneficiaries. The results of evaluation will be make public as follows:

- After 1 month of the call closing date, an initial short list for each ESR vacancy is prepared and published (anonymised) in the website.
- After 2 months of the call closing date, The final rankings (again, one for each ESR) prepared, and the hiring procedures starts -- The highest ranked candidate for each ESR will be contacted for hiring. If such candidate is not available, the second will be contacted, *etcetera*.

Upon request, a candidate will receive feedback on the reason for their ranking.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 813782



European Commission

European Commission › EURAXESS › Jobs & Funding › ESR8 - Image-based tool tissue interaction estimation

EURAXESS

JOBS & FUNDING | CAREER DEVELOPMENT | PARTNERING | INFORMATION & ASSISTANCE | EURAXESS WORLDWIDE | LOGIN / REGISTER

BACK

SHARE

10/05/2019 science4refugees

ESR8 - Image-based tool tissue interaction estimation

WHERE TO APPLY | CONTACT | SAVE TO FAVORITES | SHOW ON MAP

ORGANISATION/COMPANY	KU Leuven	LOCATION	Belgium › Leuven
RESEARCH FIELD	Computer science › 3 D modelling Engineering › Computer engineering	TYPE OF CONTRACT	Permanent
		JOB STATUS	Full-time
RESEARCHER PROFILE	First Stage Researcher (R1)	HOURS PER WEEK	38
APPLICATION DEADLINE	15/10/2019 23:59 - Europe/Brussels	REFERENCE NUMBER	BAP-2019-294
		MARIE CURIE GRANT AGREEMENT NUMBER	813782

ATLAS is an Innovative Training Network - European Joint Doctorate project, funded under the Marie Skłodowska-Curie grant agreement N. 813782.

This four year network will recruit outstanding candidates and allow them to master the different competences needed in the field of flexible robotics and intraluminal navigation, and establish a long term program of training to answer the need of experts in this field.

In order to autonomously steer flexible instruments through complex and fragile lumens, ATLAS' research objectives involve step-changes in all essential aspects of surgical robotics:

- stretching limits of actuation to distributed, precisely controllable, compliant mechanisms;
- to distributed sensing, featuring proprioception of the own complex shape with exteroception;
- real-time reconstructed models of the complex geometry and episode in the surgical workflow;
- distributed control over the interaction with the lumen and cognition to act in this fragile context;

The project will target use-cases that belong to the following disciplines:

- Colonoscopy and Gastroscopy
- Uretroscopy

- Endovascular catherization

A strong connection with hospitals and practitioners is foreseen, as well as a close collaboration with high tech companies and research institute in the field (see Partner Organizations).

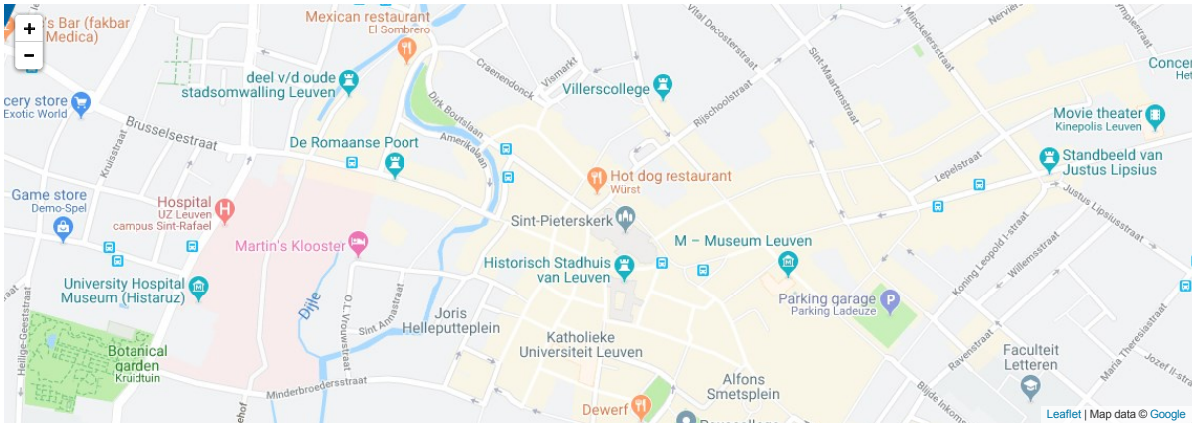
The beneficiary network is composed of 7 universities:

- KU Leuven (Belgium, coordinator)
- Sant'Anna School of Advanced Studies (Italy)
- University Of Verona (Italy)
- Polytechnic of Milan (Italy)
- University of Strasbourg (France)
- Delft University of Technology (The Netherlands)
- Polytechnic University of Catalonia (Spain)

Please refer to https://atlas-itn.eu/we-are-hiring/vacancies.

ADDITIONAL INFORMATION +

Map Information



Job Work Location Personal Assistance locations

GET MORE PERSONAL ASSISTANCE

WORK LOCATION(S)

1 position(s) available at
KU Leuven
Belgium
Leuven
3000

Open, Transparent, Merit based Recruitment procedures of Researchers (OTM-R)

Know more about it at KU Leuven

Know more about OTM-R

EURAXESS offer ID: 406678

SHARE THIS PAGE

Facebook Twitter Google+ Linkedin

Print this offer

Disclaimer:

The responsibility for the jobs published on this website, including the job description, lies entirely with the publishing institutions. The application is handled uniquely by the employer, who is also fully responsible for the recruitment and selection processes.

Please contact support@euraxess.org if you wish to download all jobs in XML.

JOBS & FUNDING
Find Jobs
Post Jobs
Find Funding
Find Hosting
Charter & Code for Researchers
Human Resources Strategy for Researchers (HRS4R)

CAREER DEVELOPMENT
For Researchers
For Organisations

PARTNERING
Find Members
Find Organisations

INFORMATION & ASSISTANCE
Living in Europe
Working in Europe
Leaving Europe
Find Personalised Assistance
Pensions
Visa and Entry Conditions

EURAXESS WORLDWIDE
ASEAN
Australia & New Zealand
China
India
Japan
Korea
Latin America & Caribbean States
North America

MY EURAXESS
Login
Register

USEFUL INFORMATION
Contact us
About EURAXESS
FAQs
Brochures
Policy Library
Useful links
Privacy statement
Legal Information

European Commission
Commission and its priorities
Policies information and services

Follow the European Commission
Facebook Twitter
Other social media

European Union
EU institutions
European Union

18%

About the Commission's new web presence Resources for partners Cookies Legal notice Contact

Sant'Anna
Scuola Universitaria Superiore Pisa

URP | SEDI | SERVIZI ONLINE | INTRANET | LOGIN | ITA | ENG

cerca (persone, informazioni, notizie, ...)

ATENEO | COLLEGIO | LAUREE MAGISTRALI | PhD | ALTA FORMAZIONE | RICERCA | QUICKLINKS

ISTITUTO DI BIOROBOTICA

PHD
BIOROBOTICA

- BIOROBOTICA
- FACULTY
- MARIE CURIE – ATLAS – RESEARCH POSITIONS
- ARCHIVIO CONCORSI

MARIE CURIE – ATLAS – RESEARCH POSITIONS

È possibile presentare la candidatura per due delle 15 posizioni **Marie Curie** bandite nell'ambito del **progetto ATLAS**, che finanzia percorsi di "European Joint Doctorate (EJD)" volti alla formazione di esperti nell'ambito della **Chirurgia Robotica**. Il progetto, coordinato dall'**Università di Leuven**, è implementato da un consorzio di sette Università, tra cui la **Scuola Superiore Sant'Anna** rappresentata dall'**Istituto di BioRobotica**, a cui si aggiungono diversi partner del mondo dell'industria.
I vincitori delle due borse Marie Curie risulteranno studenti di dottorato regolarmente iscritti presso la Scuola Superiore Sant'Anna, effettueranno il loro percorso di dottorato nell'ambito di un accordo di co-tutela che regolamenterà i periodi di ricerca alternati anche presso l'università partner.

Le due posizioni riguarderanno i seguenti temi di ricerca:

MAGNETIC DRIVING AND ACTUATION (RIF. CALL ESR 2)

Supervisori: **Arianna Menciassi**, docente dell'Istituto di BioRobotica, e **E. Vander Poorten**, Università di Leuven.

INTRALUMINAL SENSING FOR AUTONOMOUS NAVIGATION IN REMOTE DISTRICT (RIF. CALL ESR 4)

Supervisori: **Arianna Menciassi**, docente dell'Istituto di BioRobotica, e **P. Renaud**, Università di Strasburgo.

Il termine per la presentazione delle domande è il **15 gennaio 2019.**
I dettagli sui profili disponibili e sulle procedure di presentazione e valutazione delle candidature sono disponibili sul sito ufficiale al seguente link: atlas-itn.eu/we-are-hiring/

Per ulteriori informazioni contattare:
Silvia Dell'Oro, PhD staff Istituto di BioRobitca

ISTITUTO DI BIOROBOTICA
Viale Rinaldo Piaggio, 34
56025 - Pontedera, Italy
tel. +39 050 883420
fax +39 050 883497
istitutobiorobotica@santannapisa.it

ISTITUTO DI BIOROBOTICA | ISTITUTO DI DIRITTO, POLITICA E SVILUPPO | ISTITUTO DI ECONOMIA | ISTITUTO DI MANAGEMENT | ISTITUTO DI SCIENZE DELLA VITA | ISTITUTO DI TECNOLOGIE DELLA COMUNICAZIONE, DELL'INFORMAZIONE E DELLA PERCEZIONE

Sant'Anna
Scuola Universitaria Superiore Pisa

Piazza Martiri della Libertà, 33
56127 Pisa (Italia)
C.F. 93008800505

Amministrazione trasparente | Note legali | URP
Albo Online | Privacy | Servizi online
Elenco siti tematici | Ufficio stampa | Credits

ATENEO
La Scuola Sant'Anna
Rettore
Docenti e Ricercatori
Amministrazione

COLLEGIO
Concorso di Ammissione
Collegi
Corsi Ordinari
Associazione Allievi

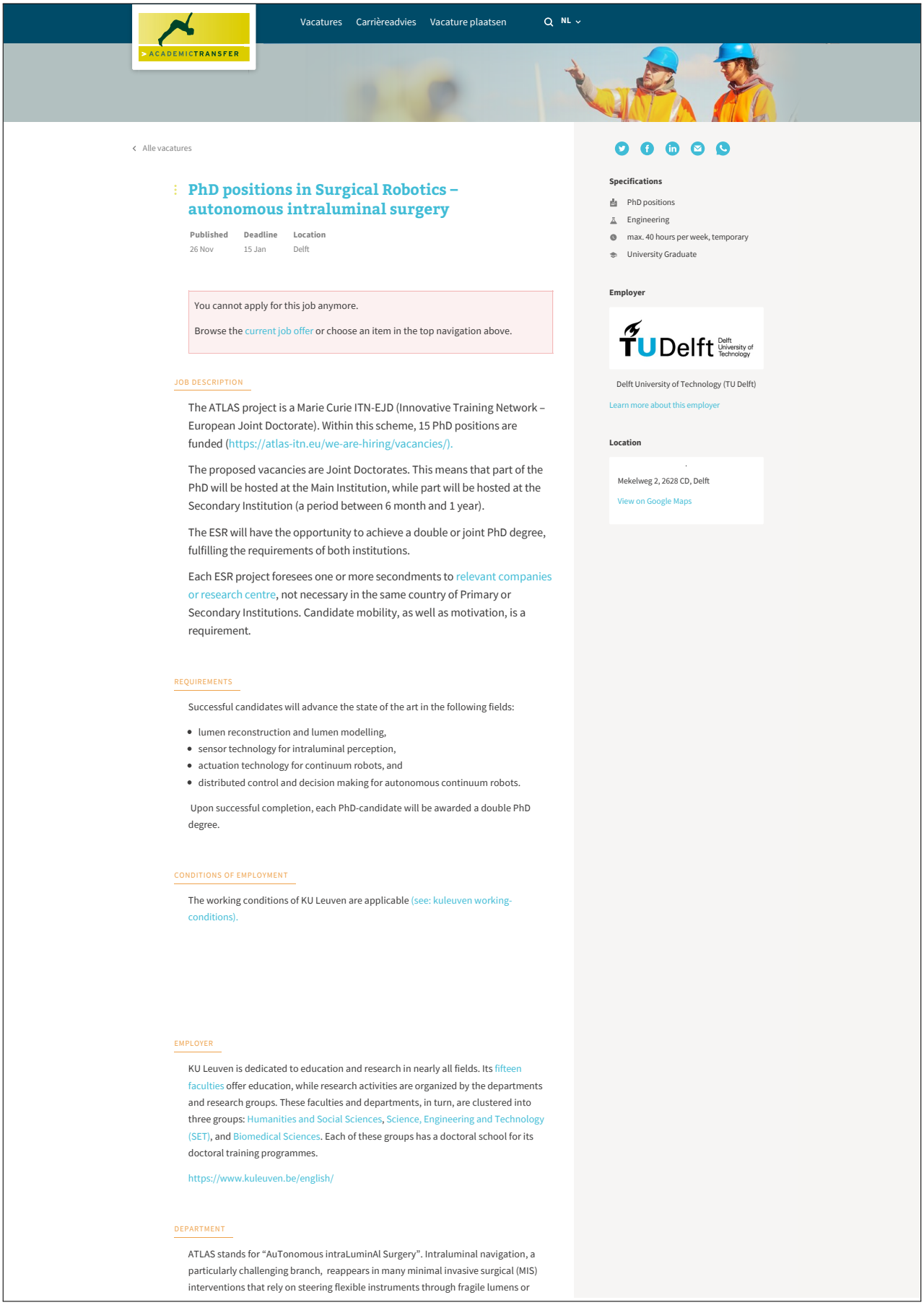
RICERCA
Istituti
Valorizzazione della ricerca
Progetti
Post-doc

LAUREE MAGISTRALI
Info e Contatti

PHD
Ammissione

ALTA FORMAZIONE
Info e Contatti


tel. +39.050.88.31.11
PEC:
protocollo@sssup.legalmailpa.it
QUICKLINKS
Studiare al Sant'Anna
Orientamento
Concorsi, Selezioni e Gare
Placement
Internazionale
Enti e imprese
Biblioteca
Sostieni la Scuola



ACADEMICTRANSFER

Vacatures Carrièreadvies Vacature plaatsen NL

‹ Alle vacatures

PhD positions in Surgical Robotics – autonomous intraluminal surgery

Published	Deadline	Location
26 Nov	15 Jan	Delft

You cannot apply for this job anymore.

Browse the current job offer or choose an item in the top navigation above.

JOB DESCRIPTION

The ATLAS project is a Marie Curie ITN-EJD (Innovative Training Network – European Joint Doctorate). Within this scheme, 15 PhD positions are funded (https://atlas-itn.eu/we-are-hiring/vacancies/).

The proposed vacancies are Joint Doctorates. This means that part of the PhD will be hosted at the Main Institution, while part will be hosted at the Secondary Institution (a period between 6 month and 1 year).

The ESR will have the opportunity to achieve a double or joint PhD degree, fulfilling the requirements of both institutions.

Each ESR project foresees one or more secondments to relevant companies or research centre, not necessary in the same country of Primary or Secondary Institutions. Candidate mobility, as well as motivation, is a requirement.

REQUIREMENTS

Successful candidates will advance the state of the art in the following fields:

- lumen reconstruction and lumen modelling,
- sensor technology for intraluminal perception,
- actuation technology for continuum robots, and
- distributed control and decision making for autonomous continuum robots.

Upon successful completion, each PhD-candidate will be awarded a double PhD degree.

CONDITIONS OF EMPLOYMENT

The working conditions of KU Leuven are applicable (see: kuleuven working-conditions).

EMPLOYER

KU Leuven is dedicated to education and research in nearly all fields. Its fifteen faculties offer education, while research activities are organized by the departments and research groups. These faculties and departments, in turn, are clustered into three groups: Humanities and Social Sciences, Science, Engineering and Technology (SET), and Biomedical Sciences. Each of these groups has a doctoral school for its doctoral training programmes.

https://www.kuleuven.be/english/

DEPARTMENT

ATLAS stands for “AuTonomous intraLuminAl Surgery”. Intraluminal navigation, a particularly challenging branch, reappears in many minimal invasive surgical (MIS) interventions that rely on steering flexible instruments through fragile lumens or

Specifications

- PhD positions
- Engineering
- max. 40 hours per week, temporary
- University Graduate

Employer

TU Delft Delft University of Technology

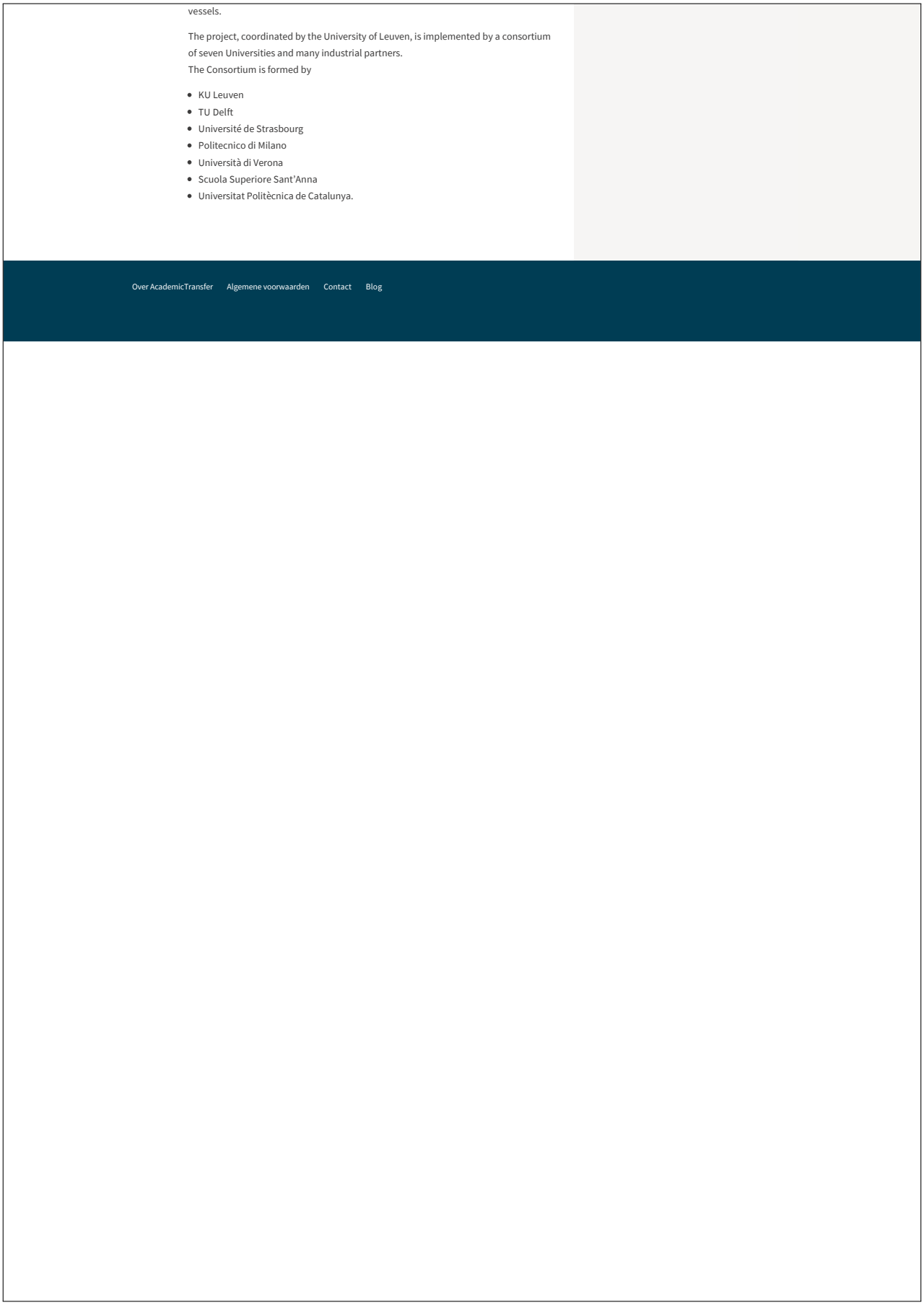
Delft University of Technology (TU Delft)

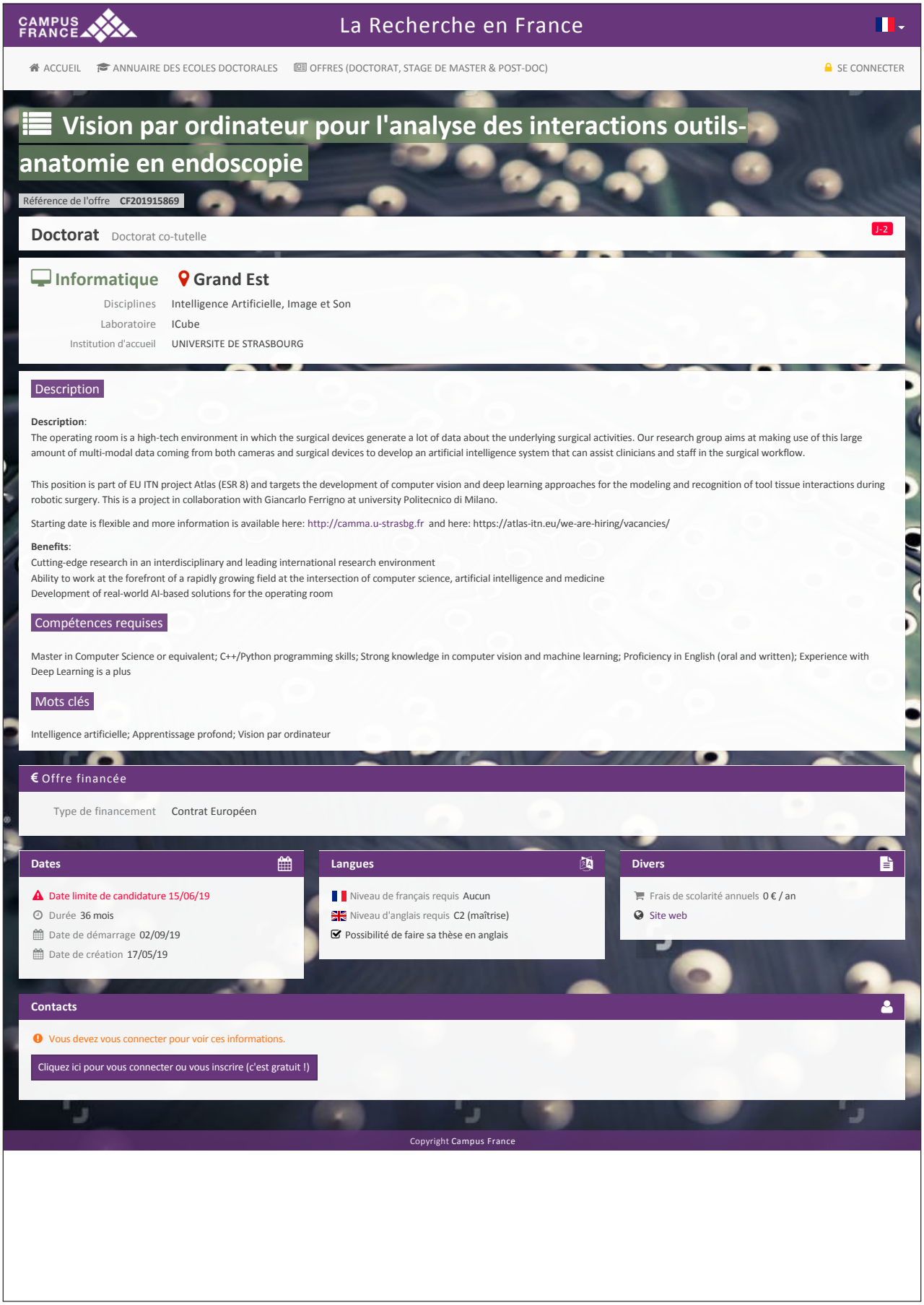
Learn more about this employer

Location

Mekelweg 2, 2628 CD, Delft

View on Google Maps


vessels.
The project, coordinated by the University of Leuven, is implemented by a consortium of seven Universities and many industrial partners.
The Consortium is formed by
KU Leuven
TU Delft
Université de Strasbourg
Politecnico di Milano
Università di Verona
Scuola Superiore Sant'Anna
Universitat Politècnica de Catalunya.
Over AcademicTransfer
Algemene voorwaarden
Contact
Blog


CAMPUS FRANCE
La Recherche en France
ACCUEIL
ANNUAIRE DES ECOLES DOCTORALES
OFFRES (DOCTORAT, STAGE DE MASTER & POST-DOC)
SE CONNECTER
Vision par ordinateur pour l'analyse des interactions outils-anatomie en endoscopie
Référence de l'offre CF201915869
Doctorat
Doctorat co-tutelle
J-2
Informatique
Grand Est
Disciplines
Intelligence Artificielle, Image et Son
Laboratoire
ICube
Institution d'accueil
UNIVERSITE DE STRASBOURG
Description
Description:
The operating room is a high-tech environment in which the surgical devices generate a lot of data about the underlying surgical activities. Our research group aims at making use of this large amount of multi-modal data coming from both cameras and surgical devices to develop an artificial intelligence system that can assist clinicians and staff in the surgical workflow.
This position is part of EU ITN project Atlas (ESR 8) and targets the development of computer vision and deep learning approaches for the modeling and recognition of tool tissue interactions during robotic surgery. This is a project in collaboration with Giancarlo Ferrigno at university Politecnico di Milano.
Starting date is flexible and more information is available here: http://camma.u-strasbg.fr and here: https://atlas-itn.eu/we-are-hiring/vacancies/
Benefits:
Cutting-edge research in an interdisciplinary and leading international research environment
Ability to work at the forefront of a rapidly growing field at the intersection of computer science, artificial intelligence and medicine
Development of real-world AI-based solutions for the operating room
Compétences requises
Master in Computer Science or equivalent; C++/Python programming skills; Strong knowledge in computer vision and machine learning; Proficiency in English (oral and written); Experience with Deep Learning is a plus
Mots clés
Intelligence artificielle; Apprentissage profond; Vision par ordinateur
€ Offre financée
Type de financement
Contrat Européen
Dates
Date limite de candidature 15/06/19
Durée 36 mois
Date de démarrage 02/09/19
Date de création 17/05/19
Langues
Niveau de français requis Aucun
Niveau d'anglais requis C2 (maîtrise)
Possibilité de faire sa thèse en anglais
Divers
Frais de scolarité annuels 0 € / an
Site web
Contacts
Vous devez vous connecter pour voir ces informations.
Cliquez ici pour vous connecter ou vous inscrire (c'est gratuit !)
Copyright Campus France

SURGROB

Surgical Robotics here and there

March 08, 2019

MORE ON THE ATLAS PROJECT

—

**** This is a guest post by Gianni Borghesan and the ATLAS team ****

ATLAS is a Marie Curie European Joint Doctorate school (GA 813782) that targets the training of experts in intraluminal robotic surgery a particularly appealing and challenging branch of robotic surgery.

If you share this interest we are currently looking for highly motivated PhD candidates !

ATLAS stands for "AuTonomous intraLuminAl Surgery". Intraluminal navigation, a particularly challenging branch that reappears in many minimal invasive surgical (MIS) interventions involves steering flexible instruments through fragile lumens or vessels. Such interventions are characterized by poor visual conditions, limited dexterity of available instruments. Control is difficult due to the presence of friction, slack and compliancy. Surgeons indicated to have concerns such as tissue damage, bleeding or rupture. Furthermore some degree of trial-and-error in maneuvering instruments is unavoidable. ATLAS aims to mitigate the mental load of surgeons by endowing partial autonomy when executing these tasks.

The project pivots on two main pillars:

1) the research activities of 15 early-stage researchers – PhD candidates will pursue a double doctoral programme, at two of the universities that are part of the consortium, plus internship in companies or research centers.

The ESRs will engage in one or more of the following research objectives,

- advances in actuation technologies for compliant mechanisms,
- advances in sensing technologies, proprioceptive (shape and force) and exteroceptive (vision and absolute positioning),
- advances in modeling – estimation of the lumen geometry and understanding of the surgical workflow,
- distributed control, compatible with perception of the fragile environment and with the surgeon's intentions.

2) the organization of targeted course and summer-schools that will allow to provide the ESRs with state-of-the-art knowledge in this domain, at the same time establish a permanent educational network that satisfies the need of highly proficient engineers in the field of surgical robotics. The skills that are identified are:

- understanding clinical needs, Operating Room (OR) constraints and surgical workflow
- understanding the surgical instrument actuation technology, approaching it in an integrated, mechatronic fashion,
- understanding intra-operative sensing technologies, in order to overcome technical limits,
- understanding intra-operative modelling, to be able to face in effective way common procedures as registration
- understanding the practical aspects in soft- and hardware integration, thus avoiding that it becomes a major obstacle when moving to higher TRL levels.

The beneficiaries, where the ESRs will be hosted, are

- KU Leuven (Belgium, Coordinator)
- Università Degli Studi Di Verona (Italy)
- Politecnico Di Milano (Italy)
- Université De Strasbourg (France)
- Scuola Superiore Sant'Anna (Italy)
- Techische Universiteit Delft (The Netherlands)
- Universitat Politècnica De Catalunya (Spain)

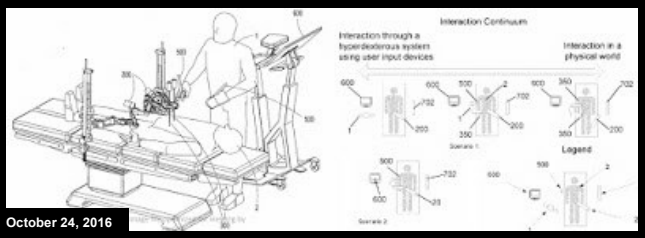
Click for mor more information!

Share

COMMENTS

POST A COMMENT

POPULAR POSTS



October 24, 2016

UPDATES ON VERB SURGICAL

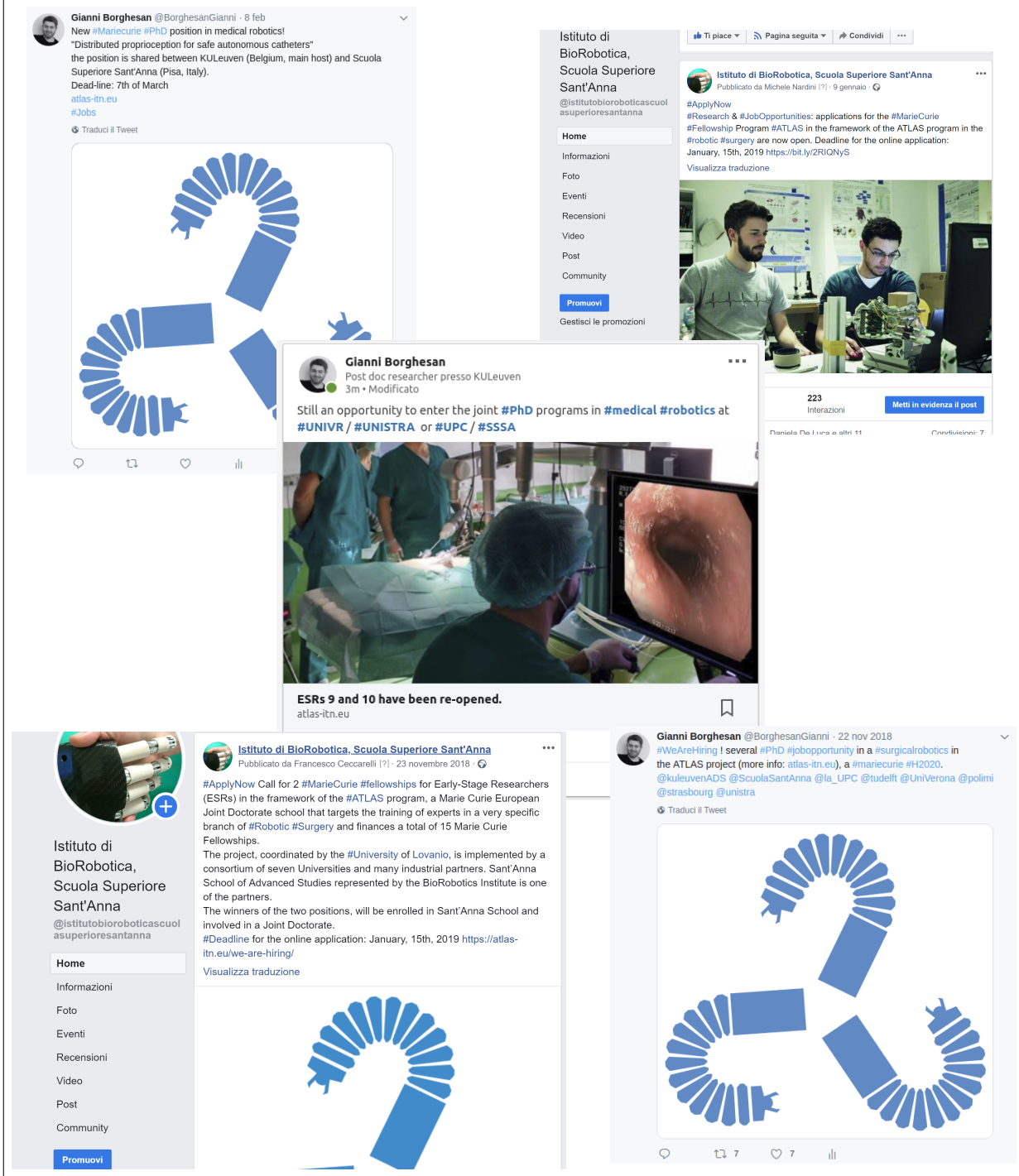
Share 7 comments

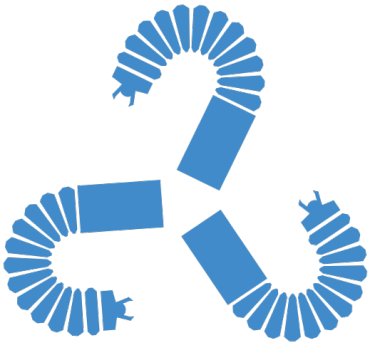
October 19, 2018

INTUITIVE'S ION

Share Post a Comment

Powered by Blogger


Gianni Borghesan @BorghesanGianni · 8 feb
New #Mariecurie #PhD position in medical robotics!
"Distributed proprioception for safe autonomous catheters"
the position is shared between KULeuven (Belgium, main host) and Scuola Superiore Sant'Anna (Pisa, Italy).
Dead-line: 7th of March
atlas-itn.eu
#Jobs
Traduci il Tweet
Istituto di BioRobotica, Scuola Superiore Sant'Anna
@istitutobioroboticascuolasuperioresantanna
Home
Informazioni
Foto
Eventi
Recensioni
Video
Post
Community
Promuovi
Gestisci le promozioni
Ti piace
Pagina seguita
Condividi
Istituto di BioRobotica, Scuola Superiore Sant'Anna
Pubblicato da Michele Nardini · 9 gennaio
#ApplyNow
#Research & #JobOpportunities: applications for the #MarieCurie #Fellowship Program #ATLAS in the framework of the ATLAS program in the #robotic #surgery are now open. Deadline for the online application: January, 15th, 2019 https://bit.ly/2RIQNyS
Visualizza traduzione
223
Interazioni
Metti in evidenza il post
Gianni Borghesan
Post doc researcher presso KULeuven
3m • Modificato
Still an opportunity to enter the joint #PhD programs in #medical #robotics at #UNIVR / #UNISTRA or #UPC / #SSSA
ESRs 9 and 10 have been re-opened.
atlas-itn.eu
Istituto di BioRobotica, Scuola Superiore Sant'Anna
@istitutobioroboticascuolasuperioresantanna
Home
Informazioni
Foto
Eventi
Recensioni
Video
Post
Community
Promuovi
Istituto di BioRobotica, Scuola Superiore Sant'Anna
Pubblicato da Francesco Ceccarelli · 23 novembre 2018
#ApplyNow Call for 2 #MarieCurie #fellowships for Early-Stage Researchers (ESRs) in the framework of the #ATLAS program, a Marie Curie European Joint Doctorate school that targets the training of experts in a very specific branch of #Robotic #Surgery and finances a total of 15 Marie Curie Fellowships.
The project, coordinated by the #University of Lovanio, is implemented by a consortium of seven Universities and many industrial partners. Sant'Anna School of Advanced Studies represented by the BioRobotics Institute is one of the partners.
The winners of the two positions, will be enrolled in Sant'Anna School and involved in a Joint Doctorate.
#Deadline for the online application: January, 15th, 2019 https://atlas-itn.eu/we-are-hiring/
Visualizza traduzione
Gianni Borghesan @BorghesanGianni · 22 nov 2018
#WeAreHiring ! several #PhD #jobopportunity in a #surgicalrobotics in the ATLAS project (more info: atlas-itn.eu), a #mariecurie #H2020.
@kuleuvenADS @ScuolaSantAnna @la_UPC @tudelft @UniVerona @polimi @strasbourg @unistra
Traduci il Tweet



The ATLAS project

lastly modified: June 13, 2019

ATLAS-D6.2-1.0.0

Horizon 2020