



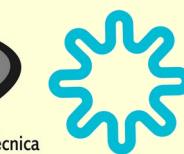
# FAB17

“Designing Emergent Realities”

# Smart Open Lab

*History of a community  
obtaining resources*

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*On behalf of the community of Smart Open Lab.*



SMART  
OPEN  
LAB



# Overview

- Where we are?
- Where are we from?
- Who we are?
- Spaces and machinery.
- Financing and sustainability.
- Internal normative.
- Day-to-day life.
- Most interesting recent projects.
- Conclusions.





## Overview

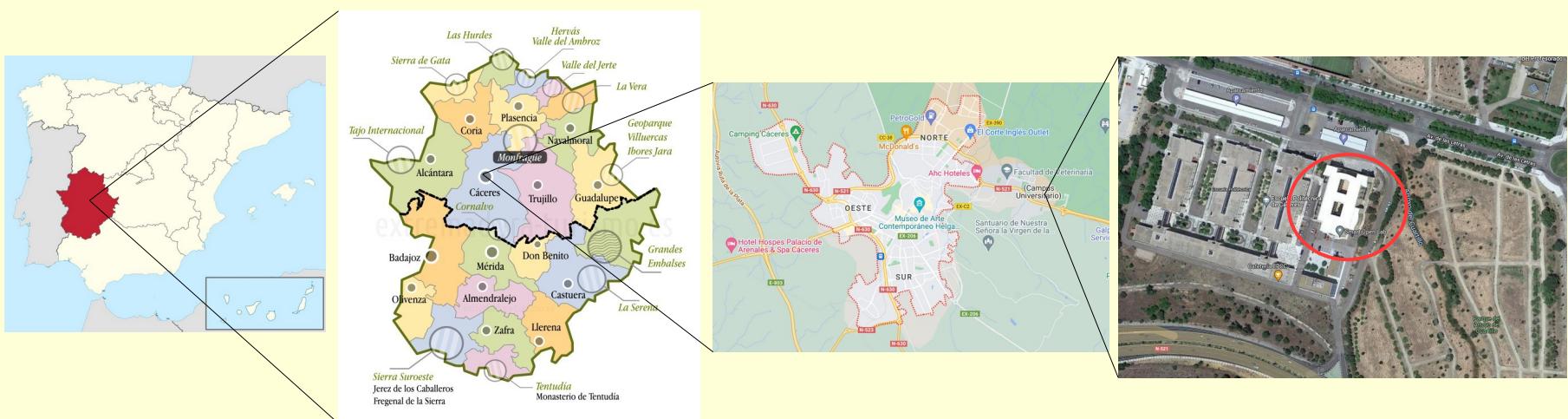
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# Where we are?

- University of Extremadura (UEx). Spain. From 1971.
- School of Technology (EPCC), in Cáceres. From 1992.
- Smart Open Lab (SOL). From 2014.



In a region rich in resources (water, minerals, food, energy...), with traditionally primary economy and natural richness.



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# Where are we from?

**Makerspace (2014): since the beginning around 80(!) people  
(10% professors, 90% students from ICT degrees).**

**Inside a room of 20 sqm with 2k€ of stuff paid by several departments  
(open electronics and 3d printers).**



**IIEA**  
Departamento de Ingeniería  
Eléctrica, Electrónica y Automática

**TC2**  
DEPARTAMENTO DE TECNOLOGÍA,  
COMPUTADORES Y COMUNICACIONES

Departamento de  
Ingeniería de Sistemas  
Informáticos y Telemáticos  
**Unex**

From the beginning one person, one vote. Everyone knows something that others can learn.

Symbolic quote of 10€/year and much activity. Reusing many things!





# Where are we from?

**Non-Profit Cultural Association (2016): formal constitution, normative (Statutes). Assembly style. Fiscal ID and possibility of billing.**

We continue growing with non-university people: *enrichment of the community.*

New spaces obtained thanks to Students Council of EPCC.



Support from professional collectives in Extremadura:



First contracts with companies through professors:





## Where are we from?

**Full Fablab (2018):** obtaining European funds (~500k€) we defined FabNEX. 4 labs in 3 cities:

- 3 inside UEx (Cáceres (150k€), Mérida (50k€) and Badajoz(50k€), in engineering schools.
- 1 inside Minimal Invasion Surgery Center, in Cáceres (250k€), focused on bioimpresion and medical applications.



A quite challenging deployment with more than 120 different components, some of them heavy or dangerous.





# Where are we from?

## Machines arrived but...

- Where to put them? New “conquers” and necessities.
  - From 60 sqm, to almost 400 sqm of not used “underground” spaces.
  - Pressure to UEx to pay the minimum necessary conditioning.



- Who mounts that all? *The community.*



- Who teach us how to use all?
  - You guess? *The community.*





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## Who we are?

A dynamic group of people...

New profiles: artisans, artists, professionals, teachers and students from other areas...



Everyone enrich a bit more.



*"If you want to light a good bonfire, you must do it with mature trunks, but you must start it with young branches."*

*L. Tolstoi. "The godchild".*



In 8 years the average age at SOL has increased by 15 years.





## Who we are?

### Small demographic study in SOL:

Approximately 150 associates today.

- Only 23% women, but continuously rising.

### Profiles:

- Students: ~33 %
- Professors: ~8%
- Employed workers: ~30%
- Liberal professionals: ~26%
- Retirees: ~3%



There are teenagers, unemployed, migrants, handicapped people....



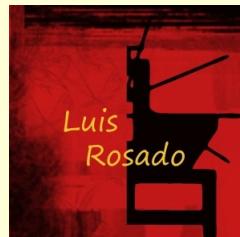


# Who we are?

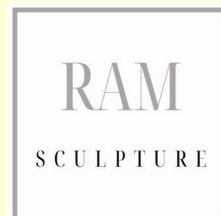
Some companies and collectives around us:



3D CÁCERES IMPRESIONADO



El Duende de la  
Tinaja





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## Spaces and machinery

We now have all the machines of the usual fablab inventory.

And quite much more....



*Always is Christmas at SOL!*



How we get things?

- From our own money. Around 150 people, and productive returns.
- From public support. We had around 5k€/year from JuntaEx since 2018.
- Donations. Many associates now see the lab as their own workshop.
- Reparations. We recover things from trash and repair them (if needed).
- Obsolescence. Are you sure it is obsolete?





# Spaces and machinery

We reorganized into 6 groups of interest, sharing 10 spaces:

- 3D Lab
- Electronics Lab
- AV Lab
- Garaje Lab
- Tex Lab
- Paint Lab
- ChemistryLab
- FoodLab



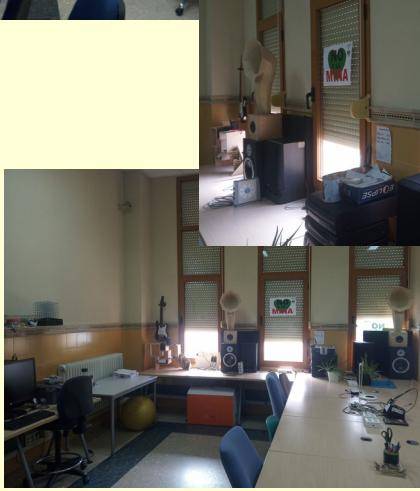


# Spaces and machinery

## A fast tour inside our lab:

- **Electronics Lab:** every associate can enter these two rooms.

Electronics, software and meetings:



“Soft” 3D lab:





## A fast tour inside our lab:

*Let's go underground!*

- 3D Lab: only for people with training.

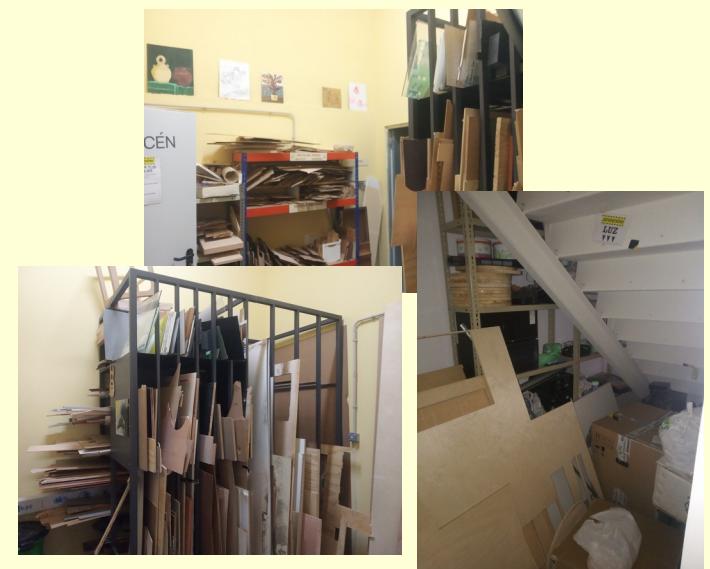


## Spaces and machinery

Entrance, kitchen, and bathroom:



Storage zone:



Message to new associates: "Do not buy materials, first learn with offcuts and then liberate us space."



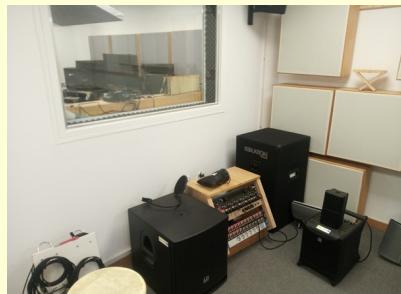


# Spaces and machinery

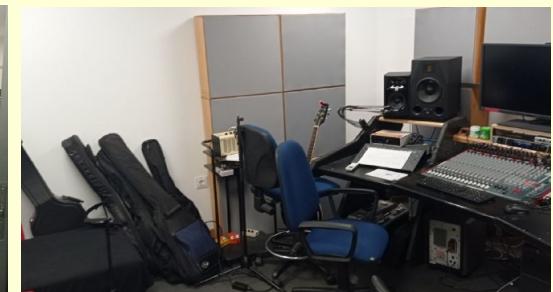
## A fast tour inside our lab:

- AV Lab: only people with training.

Recording room:



Control room:



Each room was carefully constructed and sonorized.  
Probably the most complex equipments in the labs.





# Spaces and machinery

## A fast tour inside our lab:

- Tex Lab: only people with training. Above the recording studio.



Also serves as aula for courses during weekends (the underground is accessible 24/7).





## Spaces and machinery

### A fast tour inside our lab:

- Garaje Lab: only people with training.



All kind of “analog” tools. Quite dangerous some of them. Use PPEs!





# Spaces and machinery

A fast tour inside our lab:

- Paint Lab & The Tunnel of Hell: only people with training.





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## Financing and sustainability

- Good economical situation. Around 20k€/year budget.
- We obtain money from:
  - Associates quotes.
  - Dissemination events, which can pay some materials.
  - Public financing of regional labs networks through UEx. We are subcontracted to do the real impact.
  - Developments to research groups or private companies:
    - Inside the association, in each project, those who work are paid.
    - SOL bills and manage the money.
    - It is in each group's conscience what amount is left for SOL.
    - We do not do *unfair competence* to companies.
      - If any regional company can do it, we do not do it.
      - We prefer to give formation and increase the community.





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## Internal normative

# HERE'S HOW:

- Assembly style defined in ESTATUTES:  
*"Clear accounts, long friendships."*
- Regulation for the use of machinery and spaces: training.
- Promotion of leadership and trust.
- Three types of groups:

- Management (Associates, Materials, Communication, Events, Regulations, Directive, and Jedi's Council).
- Interests.
- Projects.



- **Essential:** continuity of free core courses (normally only ice-breaking), collaborative motivating projects, and events.





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## Day-to-day life

- Advantages of being inside the University:
  - Rich intellectual environment with many developers. New ideas and contacts almost every week.
  - It serves as transmission of resources to community. And it is **bidirectional**.
  - We do not have to pay for the spaces, electricity, water...
- We never had any contracted person for maintaining the machines or the spaces:
  - Who do it? The *community*.
  - What this implies? *Individual responsibility*.  
This means every day something is missed, or not cleaned, or there are no spare parts: it is the price of sharing.

*We are not only a school of technology, but also of civism.*





## Day-to-day life

- What you have to do to use our spaces?
  - Associate to us. Everything using our wonderful webpage [www.smartopenlab.com](http://www.smartopenlab.com)

*Thanks to Wordpress community in Extremadura!*



- Demonstrate capacity to use the machines. If not, wait for the next training and start slowly.

*We will not do YOUR project, but we will help you in the crisis.*

- Contribute with community:
  - Document and share your projects.
  - Participate in the groups.
  - Participate in dissemination events.
  - Participate in improving the spaces and processes.

*“Today better than yesterday but worse than tomorrow.”*





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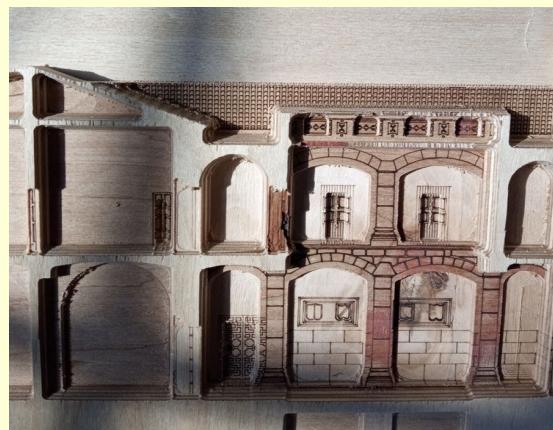
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# Most interesting recent projects

Haptics help for monuments:



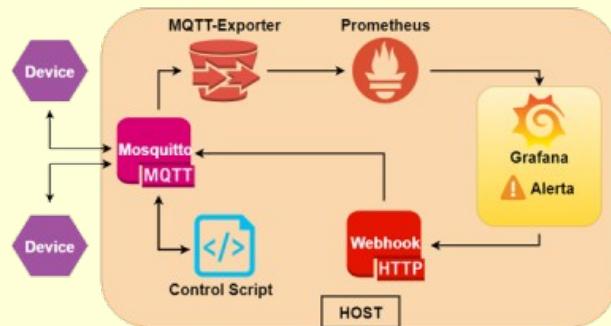
Photogrammetry for fossils:



Open Wheel-Chair:



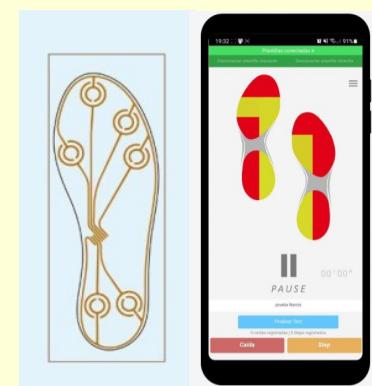
IoT applications:



LiFi positioning:



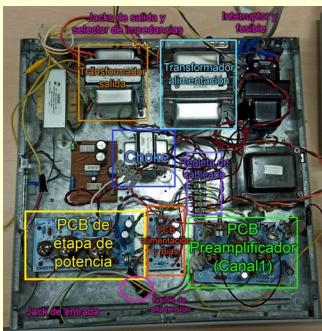
Sensorized Insoles:





# Most interesting recent projects

Tube amp workbech: Sound Systems:



Radio studio at Agora Secondary School:



#Sol\_caravan: for the next summer.



Bikes restorations (I love them):



Composting, circular economy inside UEx:



“Artivism” with IA:





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## Conclusions

- We started 8 years ago a journey which was clearly reinforced by the idea of fablabs and all the resources around.

**Many thanks to all of you!**

- With the force of community we have obtained a wonderful place to learn and develop with others.
- Around 150 free courses and 30 events. Reaching around 10.000 people.
- We have reached self-sustainability.
- Some important clues:
  - Be friendly and accessible.
  - Detect and avoid as soon as possible selfishness.
  - Everyone can teach you many things (even bad ones).
  - Looking for perfection, you ignore goodness.

**“Rome was not built in one day”.**





## Conclusions

- Next steps:

- Strengthen our position as a meeting place for creatives, a hotbed of ideas and a place for innovation. **More diffusion.**
- Not only help existing companies, but also encourage the creation of new companies. **More consultancy.**
- Participate in new forms of economy and education that are more environmentally friendly. **More awareness.**
- Participate more on the global community. **More FabFests.**





## Conclusions



# iMuchas gracias!

Look for us on twitter, instagram or FB.

You can see most of our resources and projects at [www.smartopenlab.com](http://www.smartopenlab.com)

