



メカトロニクスの日フランス週間

JFWM 2024

JAPANESE FRENCH WEEK ON MECHATRONICS

2024.09.12TH – 20^{FRI}
@ ANNECY, FRANCE

Supports:



CLUB DES
ENTREPRISES
Université Savoie Mont Blanc



Erasmus+



CAMPUS
DES MÉTIERS
ET DES
QUALIFICATIONS
D'EXCELLENCE
Mécanique connectée
et fonctions support
Auvergne-Rhône-Alpes



POLYTECH[®]
ANNECY-CHAMBÉRY

Challenge :

MAKE^{OR} BREAK

Fabien Formosa – Professor, Polytech Annecy Chambéry

Hugues Favrelière – Assistant Professor, Polytech Annecy Chambéry

Luc Marechal – Assistant Professor, Polytech Annecy Chambéry

David Gibus – Assistant Professor, Polytech Annecy Chambéry



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Groups

9 TEAMS of 4/5 students



ALLOCATED group letters and students names

GROUP A				TEAM
EL KHATIB	Hadi	MAM2	LBN	A1
OBA	Kouki	Tokyo	JPN	
GOSSET	Kilian	MP5	FRA	
BRUNO	Cédric	MP5	FRA	
EL YAMANI	Hamza	MAM2	MAR	A2
GONIN	Jean-Arthur	MP5	FRA	
TOMASI-TRI	Nathan	MP5	FRA	
LECLERC	Thomas	MP5	FRA	
KRISHT	Hassan	MAM2	LBN	A3
MITSUMATA	Juji	Tokyo	JPN	
TROUILLOT	Dylan	MP5	FRA	
COURTIAL	Erwan	MP5	FRA	
HAREL	Fabrice	MP5	FRA	

GROUP B				TEAM
KADIMBA	Emmanuel	MAM2	ZAF	B1
DE GRAVE	Nicolas	MP5	FRA	
SOIGNON	Thomas	MP5	FRA	
GENET	Clément	MP5	FRA	
JOUMAA	Ali	MAM2	LBN	B2
IMBERT	Thibault	MP5	FRA	
PONCHON	Jaël	MP5	FRA	
FUG	Mallory	MP5	FRA	
OUAKED	Amira	MAM2	DZA	B3
HORIBE	Ryuki	Tokyo	JPN	
WETTEL	Julien	MP5	FRA	
TRAMONI	Léo	MP5	FRA	

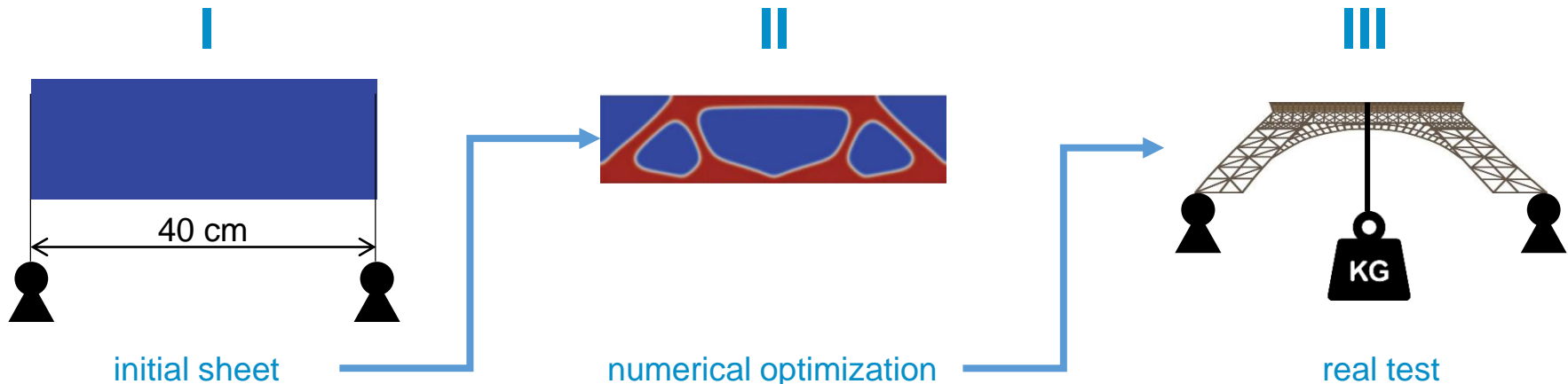
GROUP C				TEAM
ZIAT	Zineb	MAM2	MAR	C1
SHIMURA	Yuto	Tokyo	JPN	
SERMET-MAGDELAINE	Hugo	MP5	FRA	
RAMIL	Sébastien	MP5	FRA	
KHAN	Myriam	MAM2	FRA	C2
AMANO	Sota	Waseda	JPN	
BILLARD	Vincent	MP5	FRA	
COLLOMBET	Vincent	MP5	FRA	
INDORWALA	Deep Shailendrabhai	MAM2	IND	C3
SARDI	Hajar	MAM2	MAR	
SHIOKAWA	Yuma	Waseda	JPN	
MARTELLO	Rodolphe	MP5	FRA	
GARGANI	Antonin	MP5	FRA	



Challenge brief

Structural optimization of an instrumented beam : make or break!

- This year challenge aims at the fabrication of a bi-supported beam which is **as light as possible** while bearing a **maximum 20 kg static load**.
- The applied load is to **be live monitored** using an embedded load cell and displayed on a cell phone.
- Each team will be provided with the same parts (main plate, sensor, BLE Arduino board).
- Imagination and efficiency are keys as the team will make use of the available numerical and fabrication tools.
- The obtained prototype will be tested for the final test.





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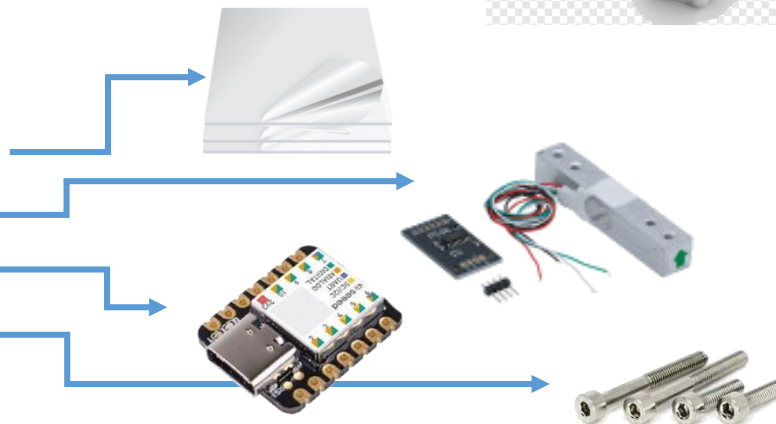
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Auvergne-Rhône-Alpes  Erasmus+



Available material and tools

→ Mechanics and Electronics

- One 450 x 45 x 6 mm³ PMMA plastic sheet
- One 20kg load cell
- One XIAO BLE nRF52840 board
- CHC screws



→ Numerical and Fabrication

- Solidworks CAD software
- Wazer mini waterjet cutter
- PLA and ABS 3D printers






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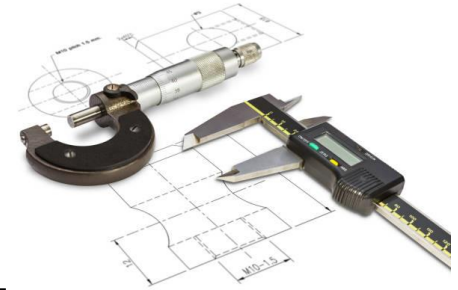


Rules

- three to four students MIXED teams
- operating a FUNCTIONAL embedded sensor load using 
- ALL the system (board, sensor...) MUST be on/in the structure
- 2 ppt slides : work partition & project management

1. ACCURACY of the load measurement
2. INTERFACE through cell phone via BLE
3. DESIGN of the structure
4. PRESENTATION : 2 ppt slides : work partition & project management

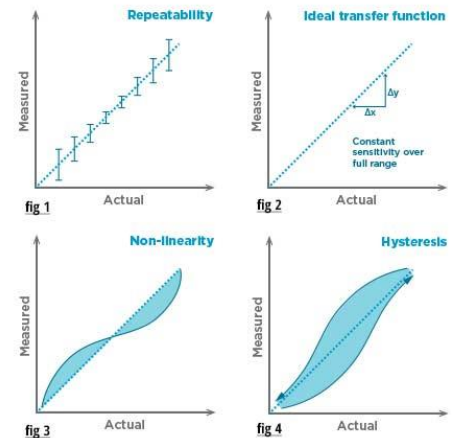




1. CALIBRATION of the load measurement

- A. Plot calibration curve
- B. Derive the sensitivity
- C. Characterise : linearity error, repeatability, hysteresis

+ 1
0
- 1



+ 1
0
- 1

2. Interface through cell phone via BLE

- A. Set up the Bluetooth communication
- B. Code an App with MIT APP Inventor2
- C. Display the sensor measurement on a phone

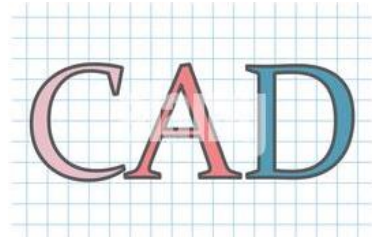




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SOLIDWORKS
 SIMULATION

3. Design of the structure

A. WEIGHT of the structure % of reduction compared to the initial material

The initial structure is a 450x48x6 mm³ PMMA beam

The final structure must match a 45mm height

B. SRENGTH of the structure (maximal load = 200 N)

C. Quality of the integration of the sensor and chips (electronic parts must be integrated in protective housings)

D. An additional beam may be used but would be counted as a penalty

+ 1
0
- 1

+ 1
0
- 1

0
- 1



Duct tape
 forbidden !



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 Erasmus+ Intelligence territoriale et française support Auvergne-Rhône-Alpes

Timeline

- Thursday September, 8
2 x 90' min (all groups)
- Monday September, 12
3 x 90' min (all groups)
- Tuesday September 13
1 x 90' min (all groups)
- Wednesday September, 14
180' min (all groups)
- Thursday September, 15
3 x 90' min (all groups)
- Friday September, 16 Final demonstration
→ **Professors will discuss and define which is the best accomplishment (achievement of goals + demonstration + teamwork)**



メカトロニクスの日フランス週間
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Program overview

Timeline

Thursday Sept 12		Friday Sept 13			Sat. Sept 14	Sun. Sept 15
08:15						
08:30						
08:45						
09:00						
09:15	Coffee 9:00 - Main Hall Polytech					
09:30						
09:45	Opening - 9:45-10:00 - A. Badel - B014					
10:00	Presentation: Program & "Challenge" - 10:00-10:15					
10:15	90' Lecture 10:15 - 11:45 Y. Suzuki, University of Tokyo Design of broadband vibration energy harvesting device B014		90' Lecture 10:00 - 11:30 T. Fujita, University of Hyogo, JP IoT modules & its tutorial by using SBC B014			
10:30						
10:45						
11:00						
11:15						
11:30						
11:45	Lunch break 11:45-13:15		Lunch break 11:30-13:15			
12:00						
13:15						
13:30	Challenge: Start 13:15 - 14:45 Groups : A, B	90' Tutorial - 13:15 - 14:45 Y. Suzuki Design of broadband vibration energy harvesting device C114 - Group : C	90' Tutorial - 13:15 - 14:45 Y. Suzuki Design of broadband vibration energy harvesting device C114 - Group : B	90' Practical work 13:15 - 14:45 T. Fujita IoT modules tutorial using SBC C213 - Group : A	Day Trip Annecy Lake	Free
13:45						
14:00						
14:15						
14:30						
14:45						
15:00						
15:15	90' Tutorial - 15:00 - 16:30 Y. Suzuki Design of broadband vibration energy harvesting device C114 - Group : A	Challenge: Start 15:00 - 16:30 Groups : C, D	Challenge 15:00 - 16:30 Groups : A, B, C	90' Practical work 15:00 - 16:30 T. Fujita IoT modules tutorial using SBC C213 - Group : C		
15:30						
15:45						
16:00						
16:15						
16:30						
16:45						
17:00						



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Groups



SCAN ME

GROUP A				TEAM
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EL KHATIB	Hadi	MAM2	LBN	A1
OBA	Kouki	Tokyo	JPN	
GOSSET	Kilian	MP5	FRA	
BRUNO	Cédric	MP5	FRA	

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GONIN	Jean-Arthur	MP5	FRA	
TOMASI-TRI	Nathan	MP5	FRA	
LECLERC	Thomas	MP5	FRA	

KRISHT	Hassan	MAM2	LBN	A3
MITSUMATA	Juji	Tokyo	JPN	
TROUILLOT	Dylan	MP5	FRA	
COURTIAL	Erwan	MP5	FRA	
HAREL	Fabrice	MP5	FRA	

GROUP B				TEAM
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KADIMBA	Emmanuel	MAM2	ZAF	B1
DE GRAVE	Nicolas	MP5	FRA	
SOIGNON	Thomas	MP5	FRA	
GENET	Clément	MP5	FRA	

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PONCHON	Jaël	MP5	FRA	
FUG	Mallory	MP5	FRA	

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HORIBE	Ryuki	Tokyo	JPN	
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TRAMONI	Léo	MP5	FRA	

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RAMIL	Sébastien	MP5	FRA	

KHAN	Myriam	MAM2	FRA	C2
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COLLOMBET	Vincent	MP5	FRA	

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SARDI	Hajar	MAM2	MAR	
SHIOKAWA	Yuma	Waseda	JPN	
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Day trip Saturday 14



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Day trip Saturday



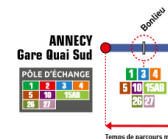
- 9:29 Bus stop « Vignière »
- 9:50 Talloires

Bus line 20



Gare d'Annecy / Vignières
→ Talloires-Montmin Angon

Du lundi au samedi, hors été



GARE QUAI SUD	05:35	06:05	06:23	07:39	08:10	08:45	09:51
Bonlieu	05:36	06:06	06:24	07:40	08:12	08:47	09:52
Parmelan	05:38	06:08	06:26	07:43	08:14	08:49	09:55
VIGNIÈRES	05:44	06:14	06:32	07:10	07:49	08:21	08:56 09:29 10:01 10:3
Petit Port Chavoires	05:47	06:17	06:35	07:15	07:53	08:25	09:00 09:33 10:05 10:3
Chavoires	05:49	06:19	06:37	07:17	07:55	08:27	09:02 09:35 10:07 10:3
Chef Lieu Veyrier	05:51	06:21	06:39	07:19	07:58	08:30	09:05 09:38 10:10 10:4
Montpellaz	05:54	06:24	06:43	07:23	08:01	08:34	09:09 09:42 10:14 10:4
Chef Lieu Menthon	05:57	06:27	06:46	07:26	08:04	08:37	09:12 09:45 10:17 10:4
Les Granges	06:02	06:32	06:51	07:31	08:09	08:42	09:17 09:50 10:22 10:5
Angon	06:08	06:38	06:58	07:37	08:15	08:48	09:23 09:56 10:28 10:5
TALLOIRES-MONTMIN Angon	06:10	06:40	07:00	07:39	08:17	08:50	09:25 09:58 10:30 11:0



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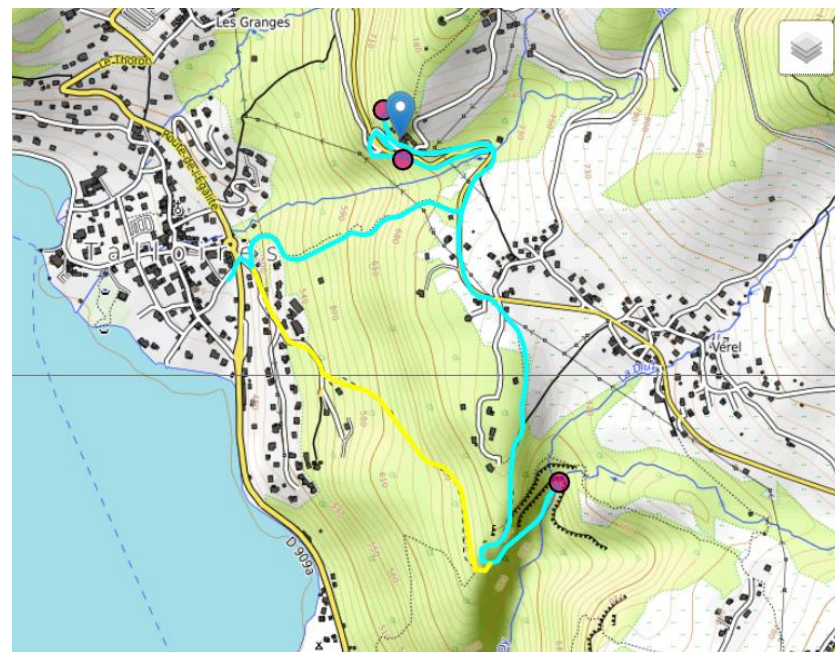
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Day trip Saturday

- Hike at
Hermitage Saint-Germain and Angon Waterfall
about 2h walk. Take sports shoes
- Snack lunch at Talloires beach
- Return by bus
- Infos will be sent by email





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Sunday activity for Japanese student

- one-hour cruise on the lake
- Sunday at 14:45

