Conférence cobotique et process – 09/10/2018

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Programme de la conférence

1. Benchmark cobotique : les enjeux de sécurité ; le marché ; les acteurs
2. Présentation succincte de MIP Robotics
3. Développements process de la robotique collaborative
   - Vissage
   - Tests
   - Machines décapage laser
   - Lignes de production
   - Education
   - Autres process (explorés)

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Benchmark cobotique - introduction

Qu'est ce que la cobotique ? Rappel de la réglementation

Guide de prévention à destination des fabricants et des utilisateurs

Pour la mise en œuvre des applications collaboratives robotisées

Edition 2017

Benchmark cobotique – le marché

Un secteur en plein boom, avec plus généralement un marché de la robotique en croissance importante – source Loup Ventures
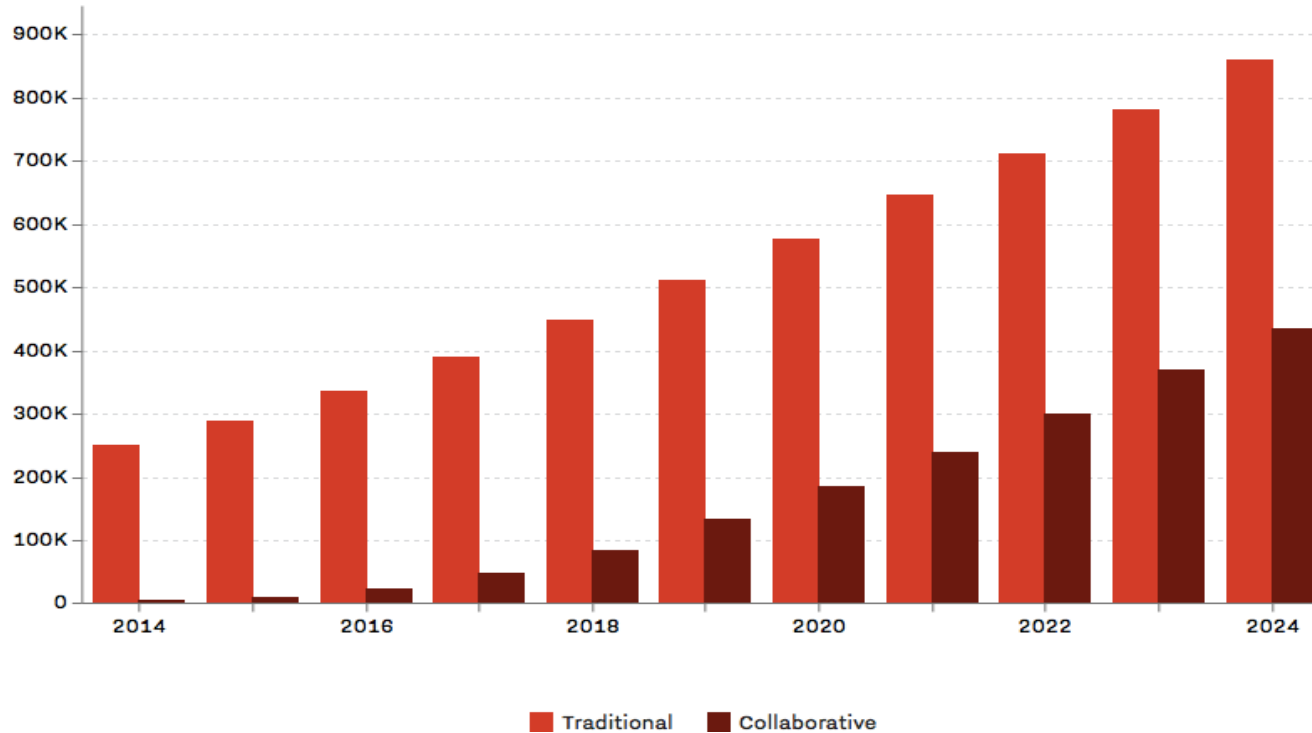
Benchmark cobotique – start-ups/scale-up

- UNIVERSAL ROBOTS

UNIVERSAL ROBOTS - UR3

kg Payload **3 KG**	$ Price **28,000 USD**	Ease of Programming ★★★★

UNIVERSAL ROBOTS
UR3

"UNIVERSAL ROBOTS ARMS ARE ADVANCED TOOLS THAT CAN BE USED BY ALL LEVELS OF PRODUCTION STAFF TO HELP INCREASE PRODUCTIVITY, REDUCE INJURY AND BOOST MORALE."

Universal Robots is a leader in the collaborative robot world. The small company is growing from the inside and is now the largest collaborative robot manufacturer worldwide.

The UR3 is the smallest platform of the company. Since the robot is quite small and has a light payload it is perfectly suited for lightweight assembly or dispensing applications. Notice that the UR3 is the only robot arm of the Universal Robots product line to have infinite wrist rotation.

UR (Universal Robots) is starting to have a large 'app store' (UR+) that includes hardware and software solutions. Their easy solutions will shorten the integration process of most automation projects and will most likely reduce the cost of integration.

These robots are easy to program, especially with the path recording features available with Robotiq Force Torque Sensors. To learn more, visit their website.

UR3

Degrees of freedom	6
Payload	3 kg
Weight	11 kg
Repeatability	+/- 0.1 mm
Reach	500 mm
Safety	TUV approved
Price	+/- 28,000 USD
Ease of programming	8/10

OUR OPINION Universal Robots are probably the collaborative robot manufacturer with the most industrial experience. This robot has proven itself time and time again, and is suitable for many different applications.

TARGETED APPLICATION
Assembly, Dispensing, pick-and-place

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Benchmark cobotique – start-up/scale-up

- Sawyer

RETHINK ROBOTICS - SAWYER

Payload
2 KG

Price
37,000 USD

Ease of Programming
★★★★

SAWYER

"SAWYER IS MORE PRECISE THAN BAXTER AND ALSO HAS BETTER REPEATABILITY, WHICH IS PARTLY DUE TO THE NEW ZERO BACKLASH GEAR BOXES AND HARMONIC DRIVE MOTORS BEING USED."

SAWYER was designed around the Baxter platform, but this version is better suited to the industrial world. The single-armed robot now has less backlash, a larger payload and much better repeatability.

Because of its internal design, both Sawyer and Baxter are highly safe to use alongside humans. In addition to the peripheral vision system placed on its "head" and the screen that lets you know the state of the robot, there are very few risks to working around this robot. It's fun, goofy, and—dare we say—loveable.

The Sawyer robot has an embedded wrist camera and can be fitted with suction cups and a parallel gripper. The robot is really compliant and adapts itself to the environment due to its high-resolution force sensing at each joint. To learn more, visit their website.

SAWYER

Degrees of freedom	7
Payload	4 kg
Weight	19 kg
Repeatability	+/- 0.1 mm
Reach	1260 mm
Safety	ISO 10218-1 Compliant
Price	+/- 37,000 USD
Ease of programming	9/10

OUR OPINION Sawyer has an excellent safety concept and a lot of different features. But since it's still complex to program, you won't be able to get it to do whatever you want immediately. Also, there can be some slightly shaky movement every now and then during its operation.

TARGETED APPLICATION
Machine tending, pick-and-place, palletizing, inspection

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- Kuka

KUKA - LBR IIWA

kg
Payload
7 KG

$
Price
70,000 USD

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010
11
Ease of Programming
★★★★★

KUKA
LBR IIWA 7 R800 & LBR IIWA 14 R820

"LBR STANDS FOR 'LEICHTBAUROBOTER' (GERMAN FOR LIGHTWEIGHT ROBOT), IIWA FOR 'INTELLIGENT INDUSTRIAL WORK ASSISTANT'. THIS SIGNALS THE BEGINNING OF A NEW ERA IN INDUSTRIAL, SENSITIVE ROBOTICS."

The LBR iiwa series has been at the top of the list of collaborative robot technology for a couple of years now. They have a lot of embedded hardware, which explains their high price.

With an excellent power to weight ratio, the LBR iiwa are equipped with highly sensitive force torque sensors at each joint. As opposed to other force limited robots that read the current in their motor, the LBR has sensors that detect micro impacts.

The LBR iiwa series also have internal routing for pneumatic and electrical devices. In other words, you can fit a device on the robot and connect it in its wrist, and no wires will be visible. These robots are stand-alone; they do not have grippers or other devices that can be fitted directly on them. To learn more, visit their website.

LBR IIWA 7 R800 & LBR IIWA 14

	iiwa 7 R800	PRob 2R 48V
Degrees of freedom	7	7
Payload	7 kg	14 kg
Weight	22 kg	30 kg
Repeatability	+/- 0.1 mm	+/- 0.15 mm
Reach	800 mm	820 mm
Safety	Uses SafeOperation software, Complying to ISO 10218; ISO 12100; ISO 13849	
Price	+/- 70,000 USD	
Ease of programming	9/10	

OUR OPINION The LBR iiwa robots are extremely high-tech and have some very interesting safety features. However, they are quite expensive, which could reduce the return on investment of a robotic cell.

TARGETED APPLICATION
Machine tending, Product testing, Palletizing, Pick and Place

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- ABB

Benchmark cobotique – MIP Robotics

- MIP Robotics : le challenger français

Payload
3 KGs

Price
9500€

Ease of Programming
★★★★★

Degrees of freedom	4
Payload	3 kgs
Weight	12,5 kgs
Repeatability	+/-1 mm
Reach	600mm
Safety	Marquage CE
Price	9 500€
Ease of programming	10/10

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MIP Robotics : qui sommes-nous ?

- MIP Robotics : le challenger français
https://www.youtube.com/watch?v=mUKk9N660C4

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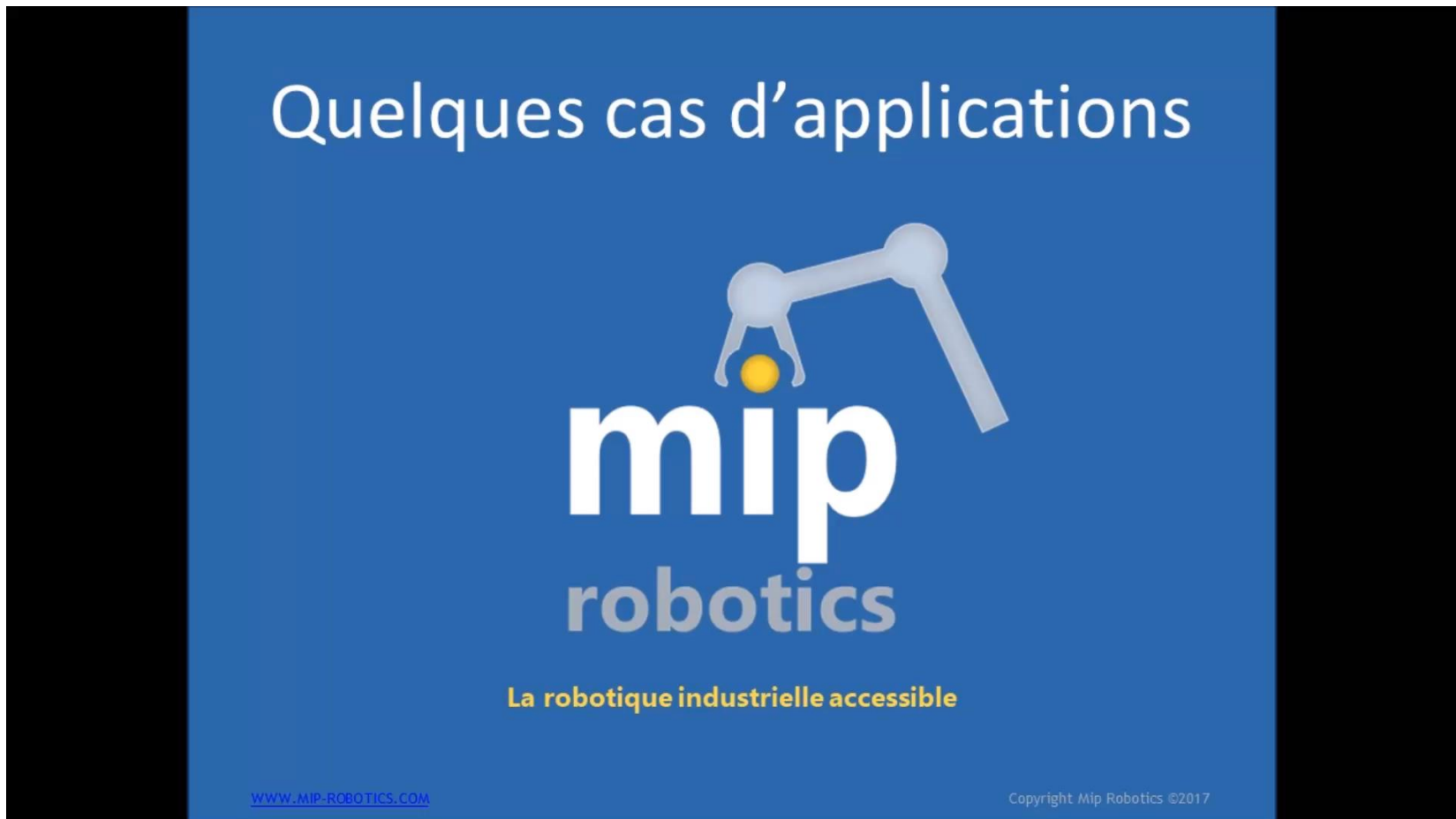
Applications process – le robot vissage

- Application en lien avec la société DOGA, spécialiste français du vissage industriel
https://www.youtube.com/watch?v=UII1LTBVAgM

Applications process – les robots de tests

- Un des process les plus intéressants pour les robots collaboratifs dans l'industrie : l'automatisation des processus de test :
  https://www.youtube.com/watch?v=0gN4KTaF_pA&authuser=0
  o Machines de contrôle
  o Procédures de test souvent répétitif, sans valeur ajoutée réelle pour l'humain
  o Nécessité d'une simplicité d'utilisation pour la machine utilisée

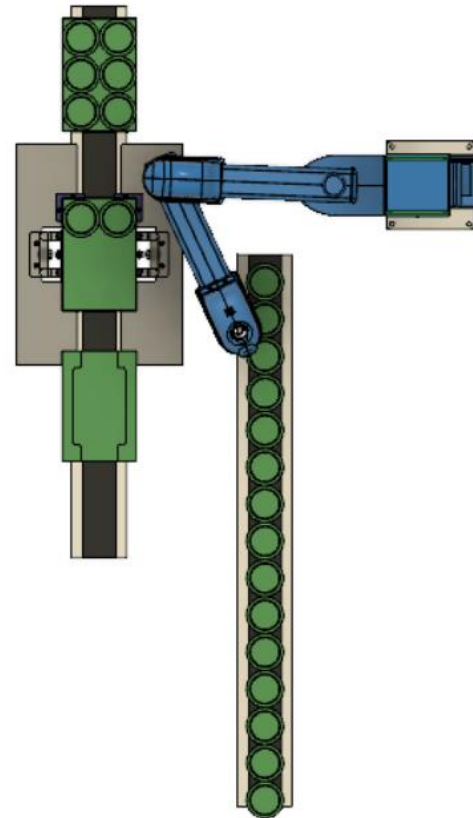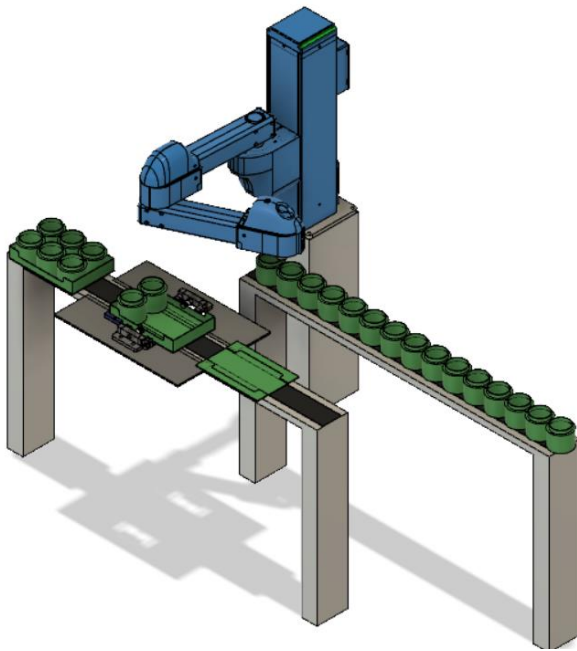# Applications process – décapage laser robotisé

- En lien avec la société SILLTEC spécialiste décapage laser
https://www.youtube.com/watch?v=cw7J_lVgHsw

AUTOMATISATION DU DECAPAGE LASER

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- Des applications principalement en développement à ce stade – exemple ci-dessous de proposition faites par MIP Robotics

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Applications process – le robot pour l' éducation

- Application en lien avec la société ERM, spécialiste français des systèmes didactiques - https://www.youtube.com/watch?v=LKAEhJctcqM
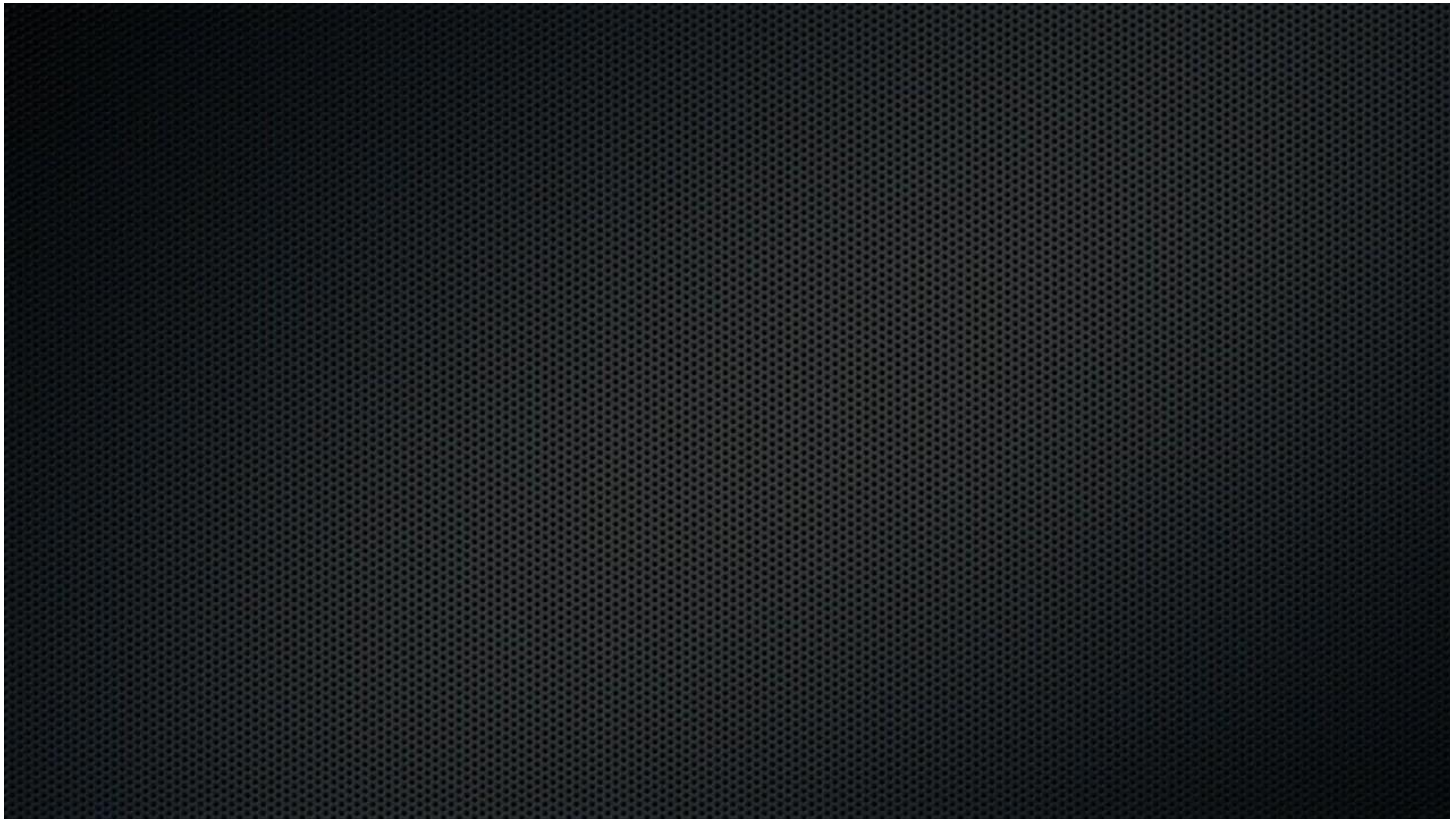
Applications process – autres

- Robots de palettisation : objectif de MIP Robotics à moyen terme
- Robot de collage
- Robot de soudure ultrason (tête Rinco dans une application client)
- Peinture ?
- Autres ? MIP est ouvert à des partenariats avec des entreprises spécialistes d'un secteur donné !

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