

JOURNÉE DE LA ROBOTIQUE UL 2023

Prospectif #1

Une initiative conjointe du



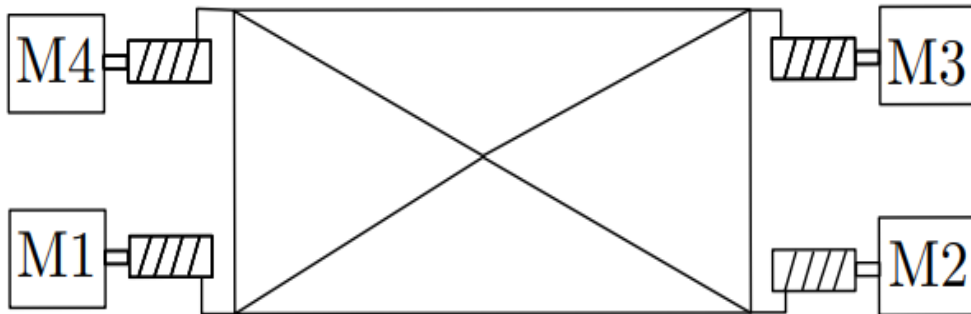
TRANSMISSION SYSTEMS FOR EXTENDING THE WORKSPACE OF PLANAR CABLE-DRIVEN PARALLEL ROBOTS

Foroogh Behroozi, Étudiant(e) au doctorat

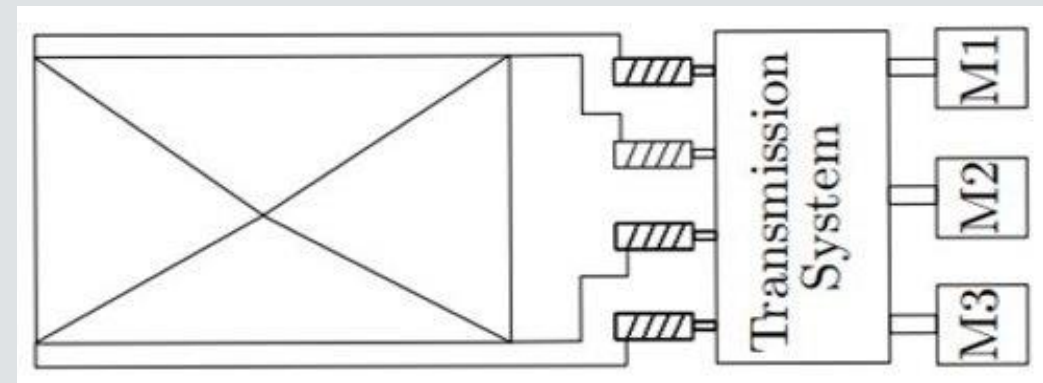
Sous la supervision de : Philippe Cardou et Stéphane Caro

CONTEXTE ET MOTIVATION

- Use fewer motor with conserve the performance
- Use 3 motors to drive 4 cables



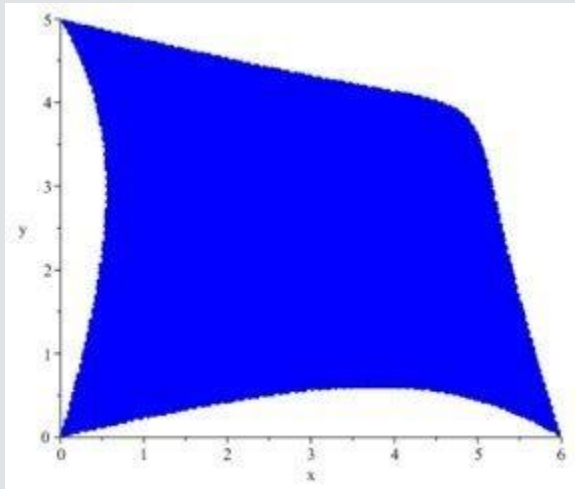
Classic version of 2-DoF CDPR



New approach for 2-DoF CDPR

- Using Transmission system
- Drive more than one cable by a motor

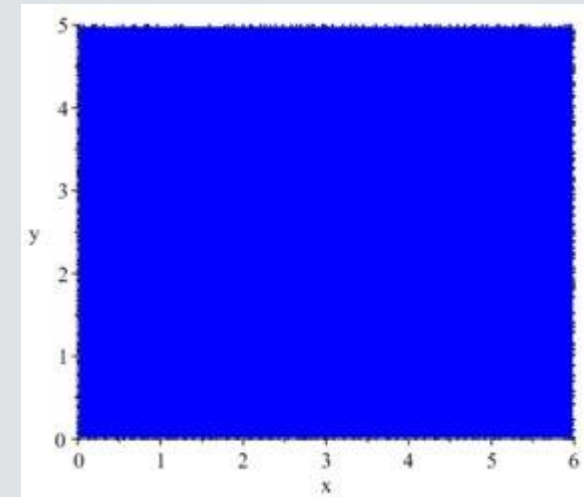
PROBLÉMATIQUE ET TRAVAUX DE RECHERCHE



Khodadadi et al. (2021)

- Could not cover the workspace
- Finding an appropriate transmission system

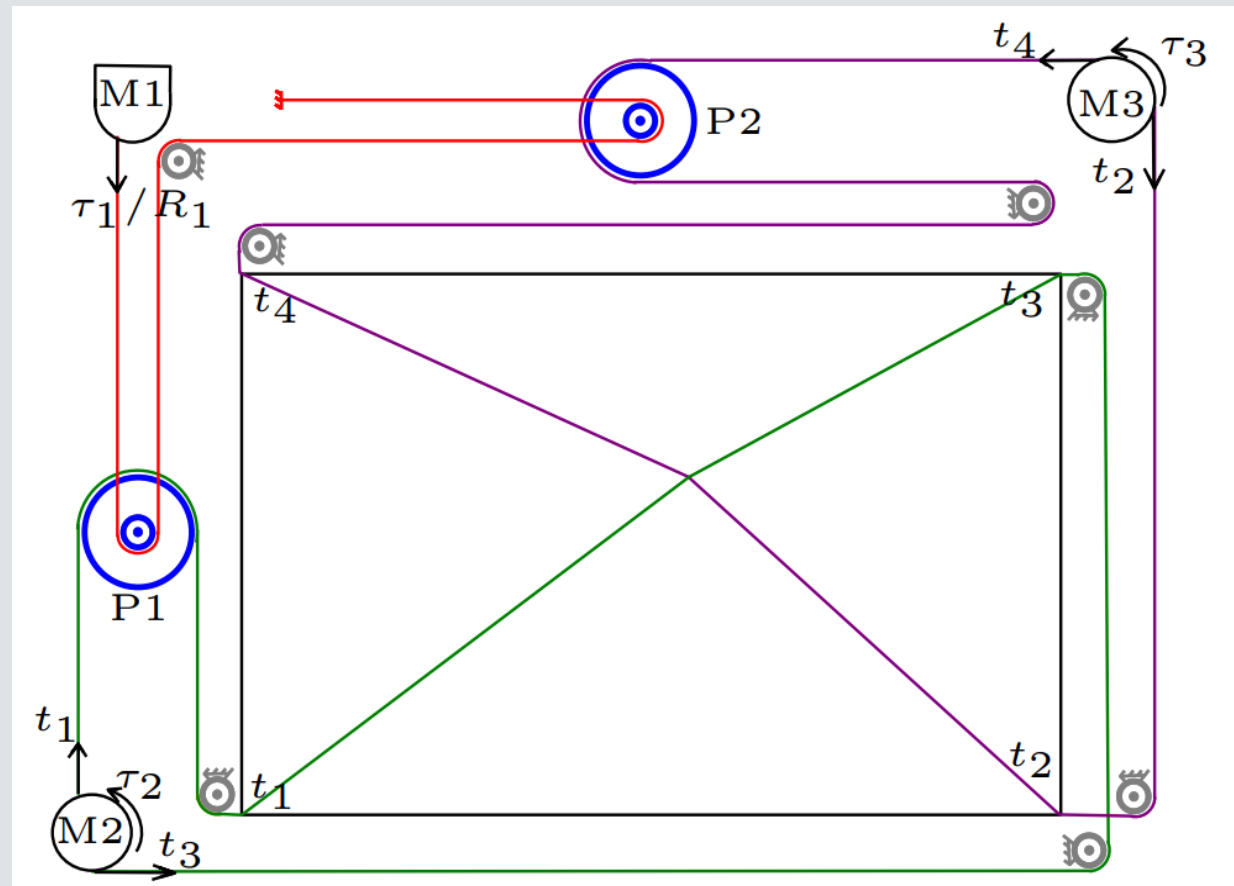
- Present the linear transmission between actuators and winches
- Increase the workspace



Workspace of proposed method

DISCUSSIONS ET RÉSULTATS

- Use motor to control the tension in cables
- Guide two cables by a motor
- Use 2 moving pulley
- Use closed loop cable
- Unwind a cable while the other unwinding



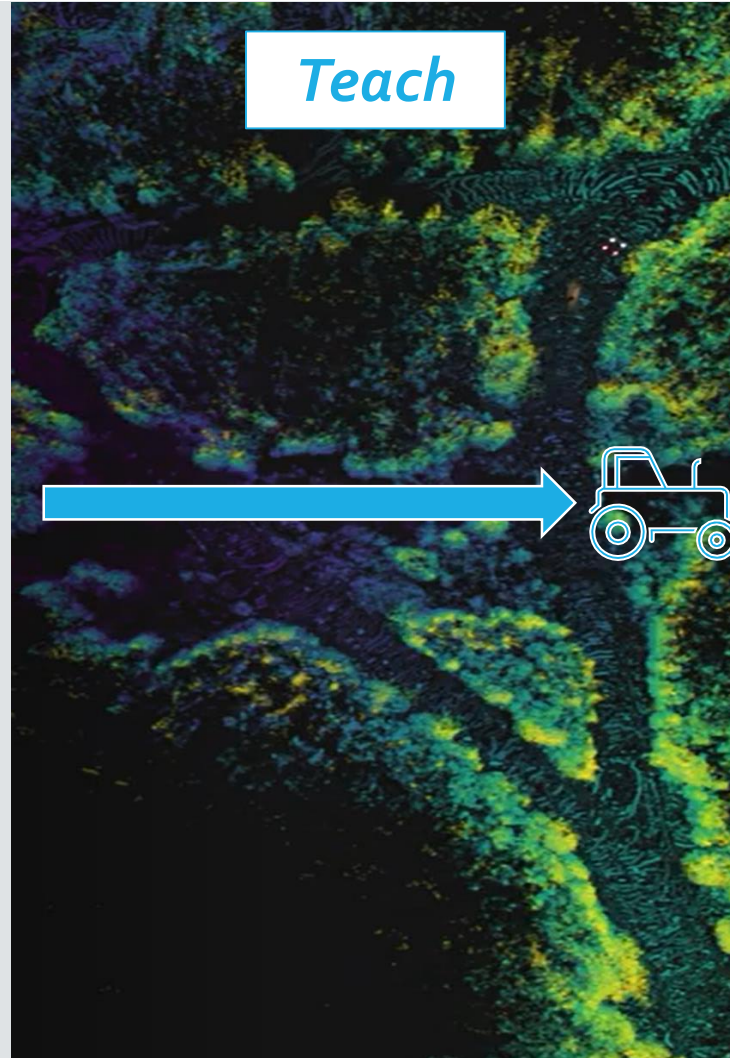
PERCEPTION AVANCÉE POUR APPLICATION FORESTIÈRE

Olivier Gamache, Étudiant(e) au doctorat

Sous la supervision de : Philippe Giguère

Affiliation : Norlab

CONTEXTE ET MOTIVATION



PROBLÉMATIQUE ET TRAVAUX DE RECHERCHE

- Robustesse aux changements de l'environnement



Segmentation
sémantique

Réseau
implicite

BRACKETING



8 ms



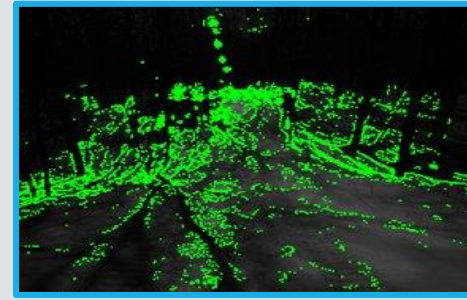
16 ms



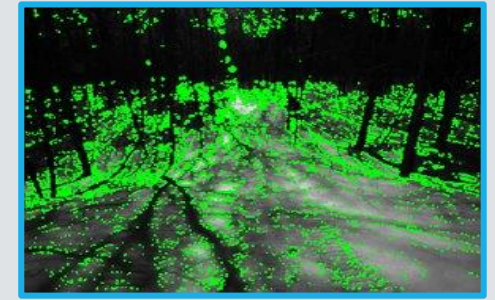
32 ms



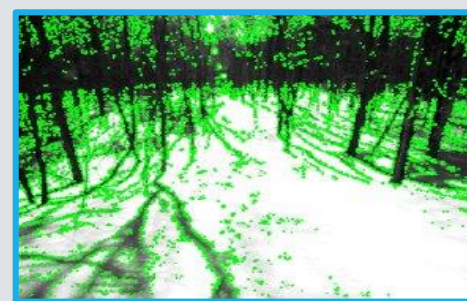
64 ms



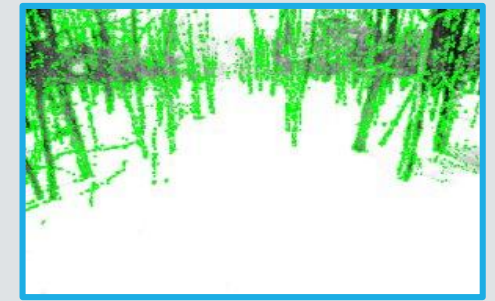
t_1



t_2



t_3



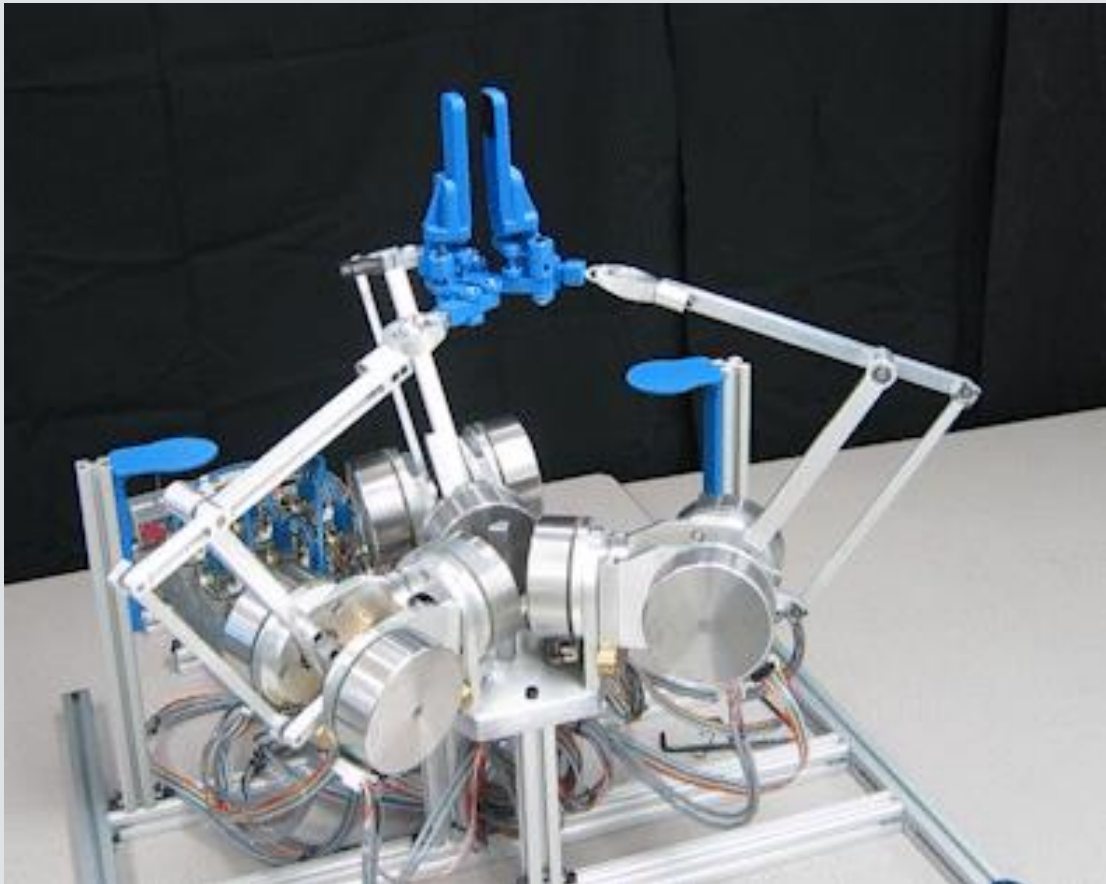
t_4

ROBOT PARALLÈLE À (6+3) DDL AVEC DES MOTEURS FIXES

Arda Yigit, Stagiaire postdoctoral

Sous la supervision de : Clément Gosselin

CONTEXTE ET MOTIVATION



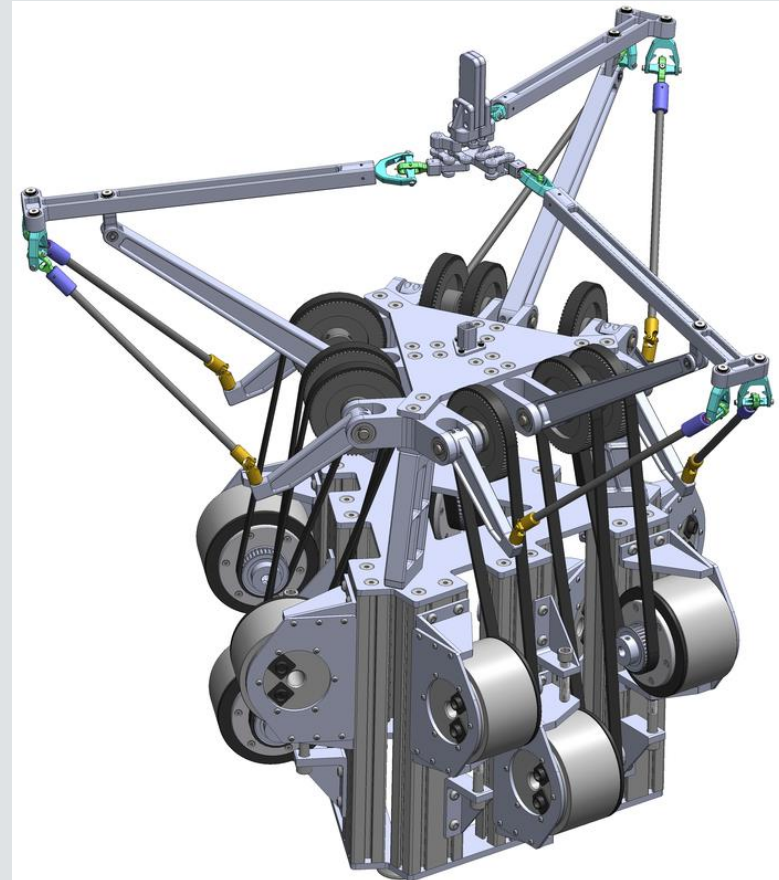
[Nguyen et al., 2020]

- Redondance cinématique
 - Espace de travail
 - Interférences
 - Plateforme configurable
- Robot à (6+3) DDL de *Nguyen et al.*:
 - Moteurs mobiles
 - Limite les performances

**PEUT-ON AVOIR TOUS
LES MOTEURS FIXES ?**

DISCUSSIONS ET RÉSULTATS

- Fabriquer le prototype
- Comment mieux exploiter la redondance ?
- Comment gérer l'interaction avec les humains ?
- Trouver des idées pour la suite



[Yigit et al., 2023]

LES DÉFIS ET ENJEUX DE L'UTILISATION DES ROBOTS SOUS-MARINS DU LABORATOIRE TAKUVIK POUR L'ÉTUDE DES MERS ENGLACÉES

Marie-Hélène Forget et Guislain Bécu (PPR), Lisa Matthes (post-doc),
Bastian Raulier (maîtrise)

Sous la supervision de : Marcel Babin

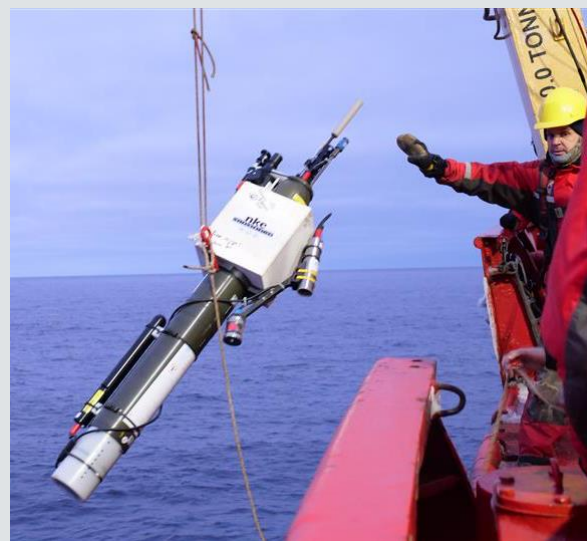
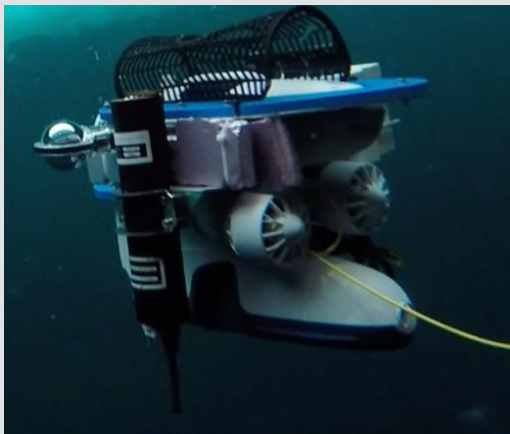
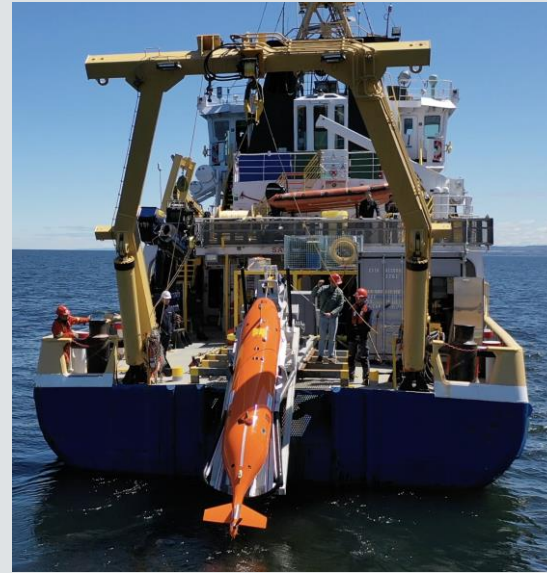
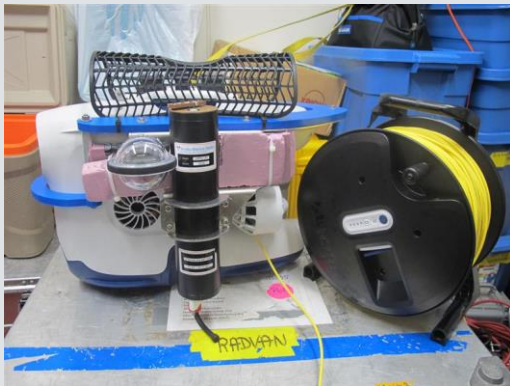
Affiliation : Takuvik

IRL TAKUVIK (UL / CNRS)

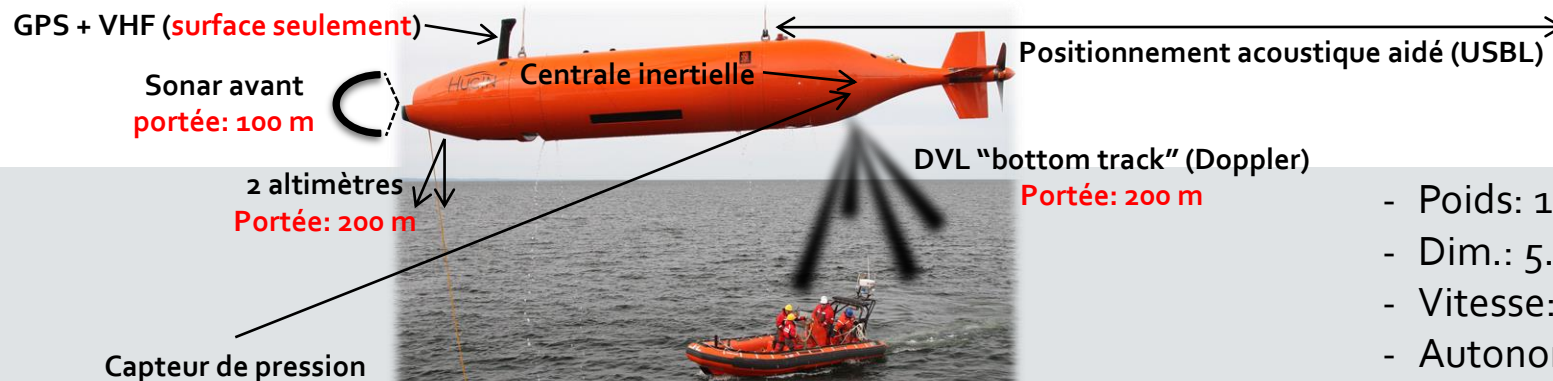
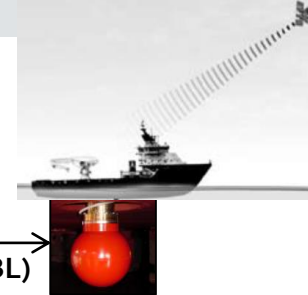


TAKUVIK

<http://www.takuvik.ulaval.ca/>

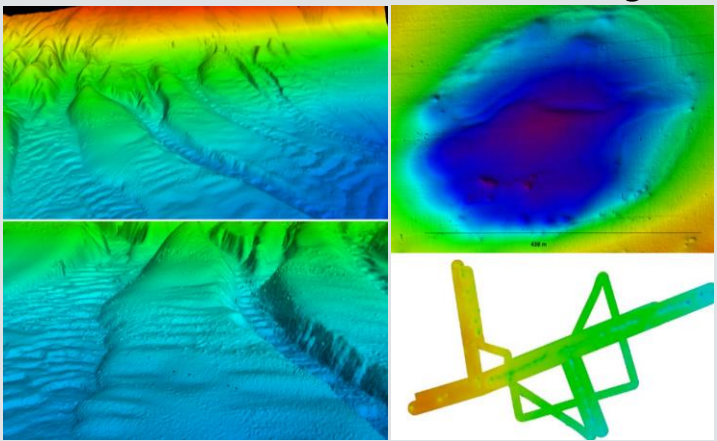


AUV & NAVIGATION SOUS GLACE

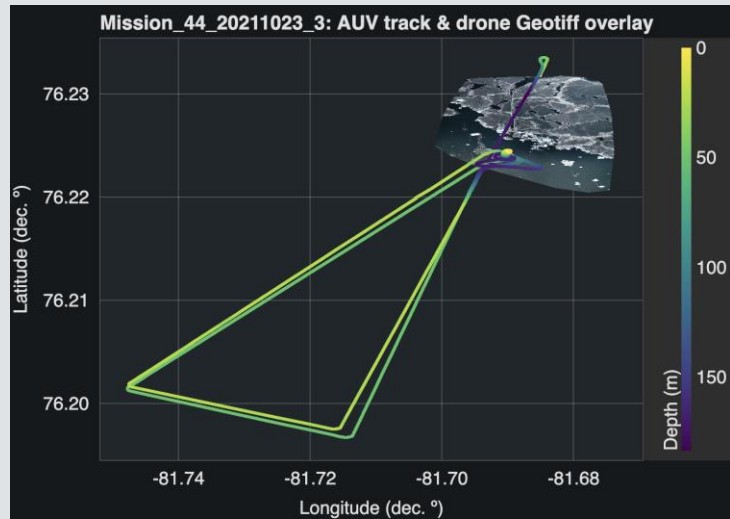


- Poids: 1.2 t (dans l'air)
- Dim.: 5.5 x 0.75 m (L x ø)
- Vitesse: typ. 4 noeuds
- Autonomie: 24 h

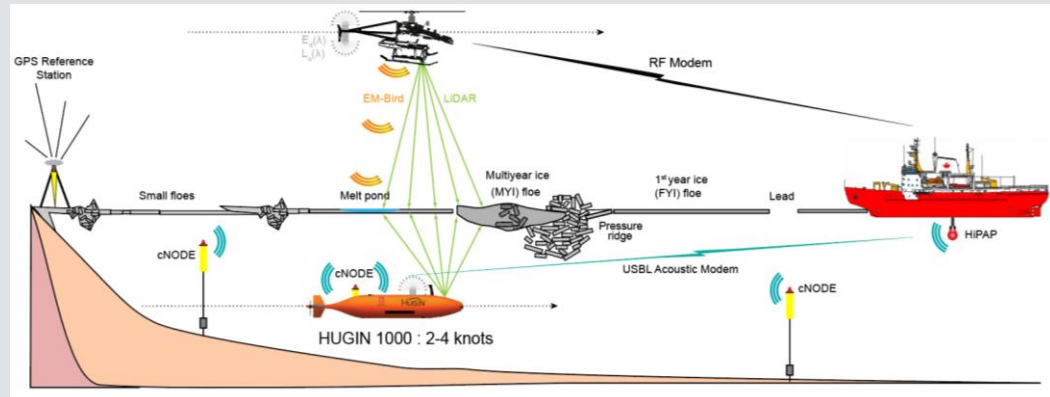
Estuaire / Golfe du St. Laurent (sans glace)



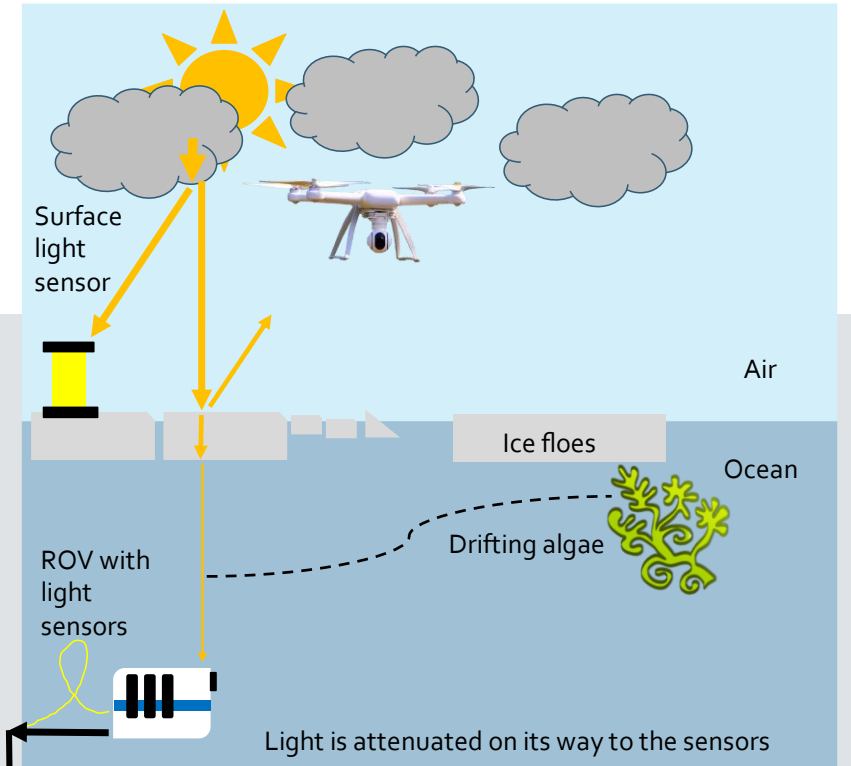
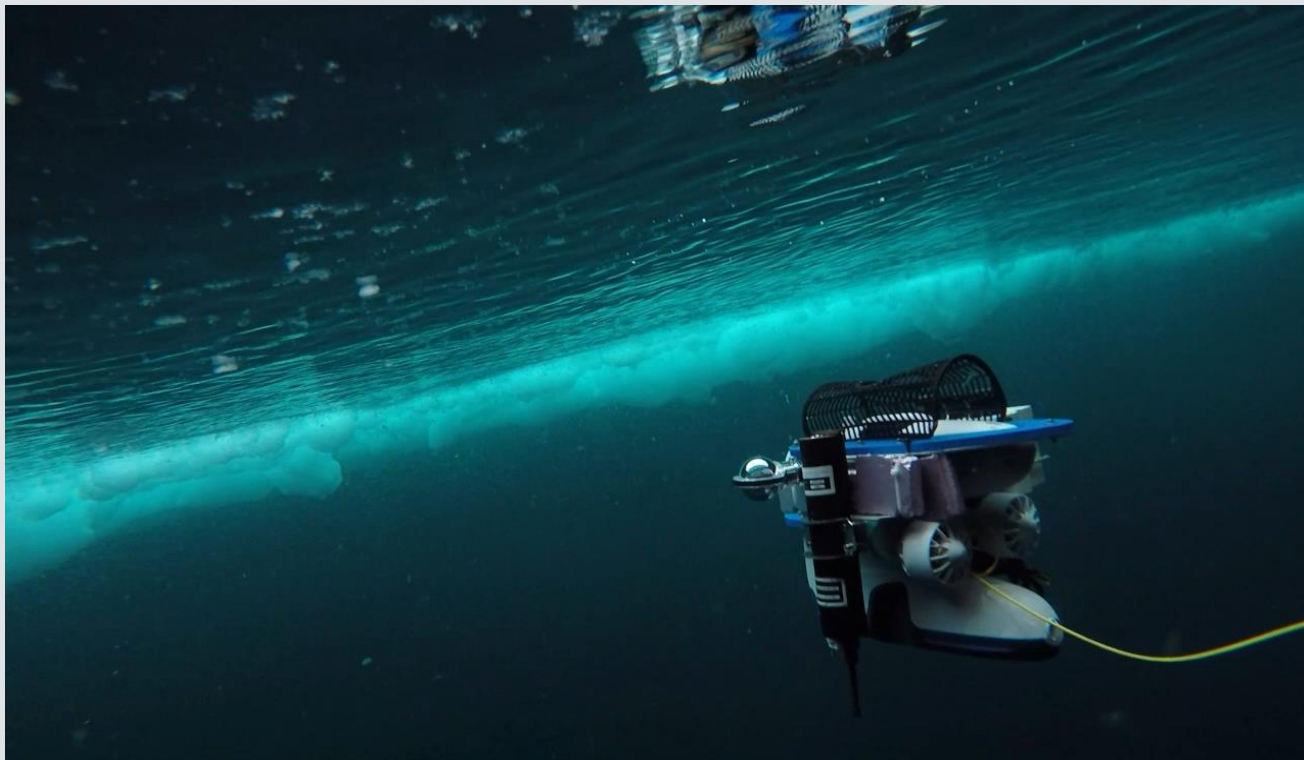
Sous la banquise et loin du fond



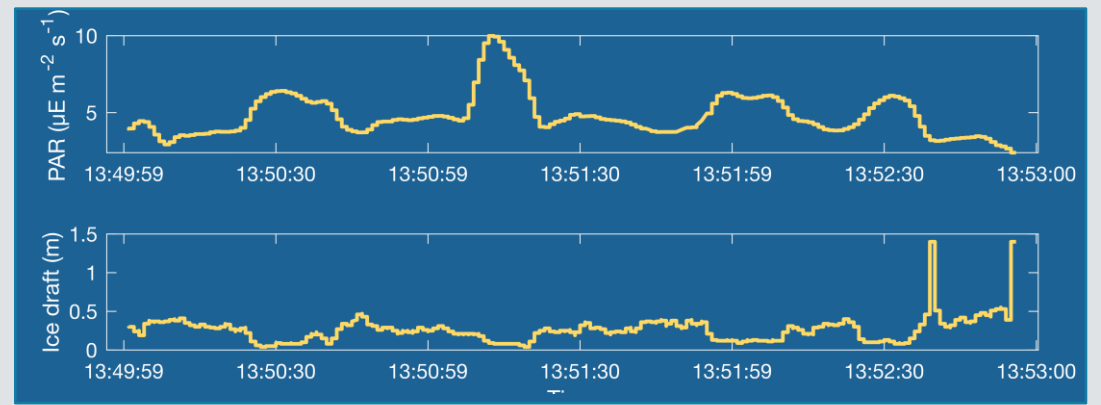
Pour les JRUL 202?



ROV



Light



Ice thickness

QUESTIONS POUR PROSPECTIF #1