

# 7a.028.TUT – Co-Botics – Intelligent Cooperating Robots and Humans – Phase II

## Project - Team

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				<b>Funded By: Business Finland</b>

## Project - Summary

Computational models designed to automate and monitor interactions between humans and robots that provide humans and robots with an appropriate mental model of how the others (humans and robots) will react to various behaviors, data quality, instructions and environmental changes are of extreme importance for collaborative robotics, referred here as “co-botics”. The planned research will focus on the application of advanced machine learning and pattern recognition methodologies for facilitating shared intelligent cooperation between robotic units and humans. Advanced multi-modal (or otherwise called multiview) data analysis aiming at describing cues from the real world (including humans) from multiple information sources will be developed and applied to this end. Based on that technology, online visual information analysis will be combined with sensor data analysis for decision making that will be interpreted in the entire system as suggestion-based cooperation through shared intelligent interactions. The project will continue towards enhancing the performance of multi-modal visual/sensor data analysis methods for efficient robot-human interaction in efficient scheduling applications. Moreover, it will focus on creating data visualizations that combine information coming from various types of sources (visual, depth, audio) in order to provide insights on the way robots perceive their environment. We believe that such visualizations will allow us a better understand of how to enhance the overall operation and increase intelligence of robotic units in the targeted scenarios.

## Project - Novelty of Approach

- This second year of the project will allow us to visualize this imaginary world in order to better understand the way each robotic unit perceives its environment and lead to better decision-making methodologies.
- We aim at creating an augmented world representing the objects appearing in the direct environment of the robotic unit and the cooperating person(s).

## Project - Deliverables

	Deliverable
1	Advanced multi-modal analysis methodologies
2	Decision strategies (Model)

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## Spaces

- All Spaces

	CVDI 2017 IAB Fall Meeting				
	CVDI 2018 IAB Fall Meeting				
	CVDI 2018 IAB Spring Meeting				
	CVDI 2019 IAB Fall Meeting				
	CVDI 2019 IAB Spring Meeting				
	CVDI Calendar				
	CVDI Leadership				

3	Visualizations of combined data identities in latent space
4	Efficient implementation and integration to prototype

**Project - Benefits to IAB**

- The output of the project would be very beneficial for developing smart systems, such as autonomous machines, smart-building environments and multi-sensor based decision making.
- It would benefit in processing data using various types of information, e.g. visual, spectral, attribute, in order to enhance data analytics performance.

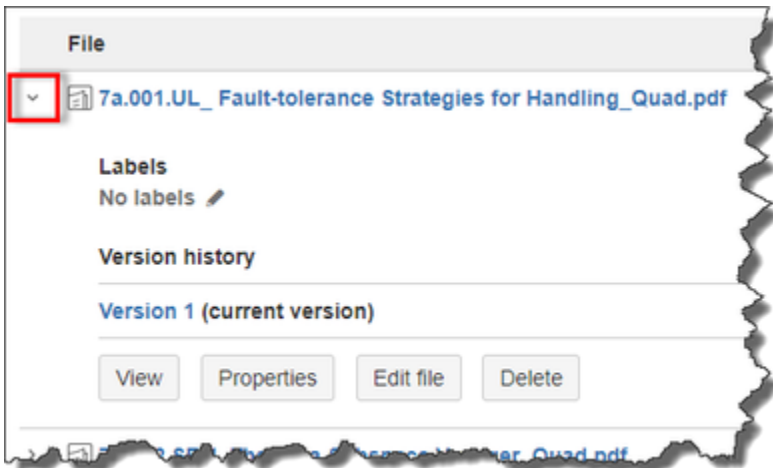
**Project - Presentation Video (Spring 2018)**

[Video Link \(7:03 minutes\)](#)

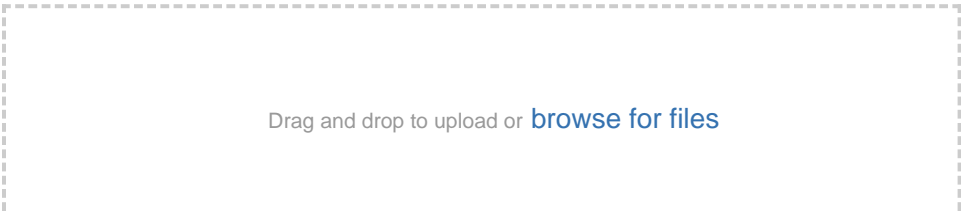
**Project - Documents**

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File	Modified
>  7a.028.TUT_Co-Botics – Intelligent Cooperating Robots_Quad_2017 Fall Meeting.pptx	Nov 15, 2017 by Sally Johnson
>  7a.028.TUT_Executive Summary.pdf	Feb 28, 2018 by Sally Johnson
>  7a.028.TUT_Quad Chart_2018 Spring Meeting.pptx	Mar 16, 2018 by Sally Johnson
>  7a.028-TAU-CVDI-Mid-Year-Report_cobotics.pdf	Jan 23, 2019 by Sally Johnson



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IAB - Industry Advisory Board	+ ★ ☆
Year 6 - Funded Projects (7/1/17 - 6/30/18)	+ ★ ☆
Year 7 - Funded Projects (7/1/18 - 6/30/19)	+ ★ ☆
Year 8 - Proposed Projects	+ ★ ☆



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**Project - Comments**