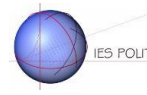




**ARVETI4.0 –**  
Project partner:



**LTTA2: presentation of the project developed by Ghiringhelli Spa**

# Machine movements simulation



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Giacomo Pistoletti  
Nicolò Palmeri  
Domenico Arvonio  
employees of technical office and  
assembly department

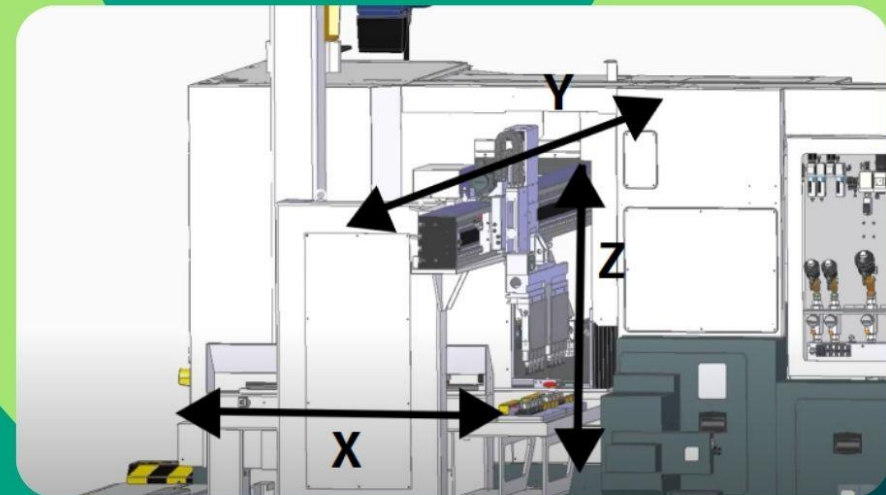
# Work team



This project has been developed by Ghiringhelli S.p.A. Thanks to our company tutor Domenico Arvonio and to all the member of the technical office and assembly department.

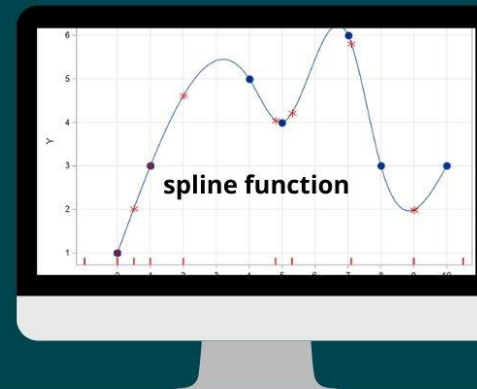
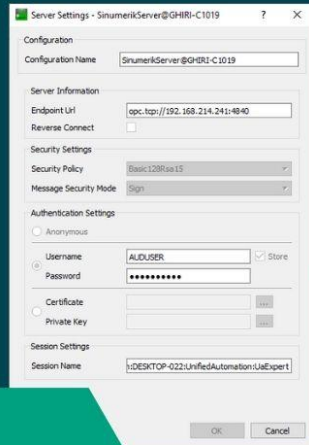
# Aim of the project

Being able to simulate the real machine movements in the 3D's Cad simulator.



# Project contents

- Machine movement simulation in all of the three axes
- Using joints for the movement
- Connecting to a real machine through OPC UA server
- Reading the axes values



#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Timestamp	Statuscode
1	SinumerikServer@GHIRI-C1019	NS2 String Plc/DB500.DBD752:REAL		0	Double	17:15:03.457	17:15:03.534	Good
2	SinumerikServer@GHIRI-C1019	NS2 String Plc/DB500.DBD792:REAL		300	Double	17:15:03.857	17:15:03.863	Good
3	SinumerikServer@GHIRI-C1019	NS2 String Plc/DB500.DBD832:REAL		796.700317383	Double	17:14:58.573	17:14:58.613	Good

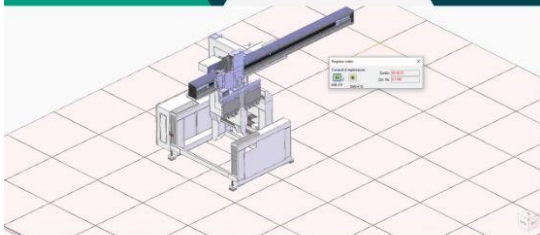


# Excel macros and Solid Edge

- Making an application that pulled data from the OPC UA server every second and saved the data to a CSV file.
- The application has features to set an execution time and change the exported data file path.
- The application was made through the use of the VBA programming language and Excel.
- After creating three CSV files containing the data for the three axes they are imported into Solid Edge where the movements of the machinery can be replayed.

	A	B	C	D	E	F	G	H	I	J	K
1		0.796.7003		1.796.7003		2.796.7003		3.796.7003		4.796.7003	
2											
3											

```
Workbooks.Add
Worksheets.Add.Name = "fogliol"
a = 1
For b = 1 To 120
  Sheets("Fogliol").Cells(1, a) = valoril(a)
  a = a + 1
Next
```

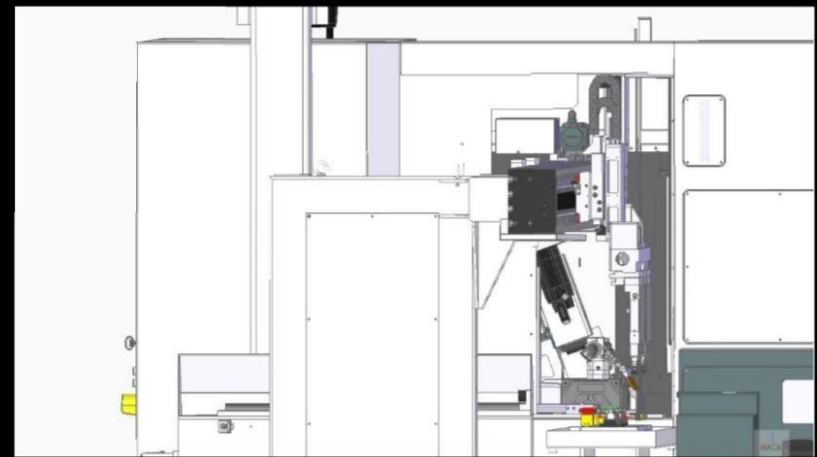


11					
12					
13					
14		Register	Unregister	<b>Node Id:</b>	<b>Registered Node Id:</b>
15				ns=2;s=/Plc/DB500.DBD752:REAL	ns=2;s=/Plc/DB500.DBD752:REAL
16				ns=2;s=/Plc/DB500.DBD792:REAL	ns=2;s=/Plc/DB500.DBD792:REAL
17				ns=2;s=/Plc/DB500.DBD832:REAL	ns=2;s=/Plc/DB500.DBD832:REAL
18		read	0.0008	Path of file: C:\PCTO\	
19			299.9899902		
20			797		
21					
22		duration of simulation(max 60 seconds):		5	





# result of the project





# Project benefits in the future



- Detecting collisions which aren't visible
- Obtaining speed and position graphs of the axes
- Viewing the machine movements remotely