Master-Thesis

Methodical Approach for Analyzing Process Parameters and Optimizing Boundary Conditions in Multi-Axis Robot Programs

Status Update: Week 08+09 (15 weeks left)

20.11.2023 – 03.12.2023

Jan Nalivaika

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State of the Art Questions

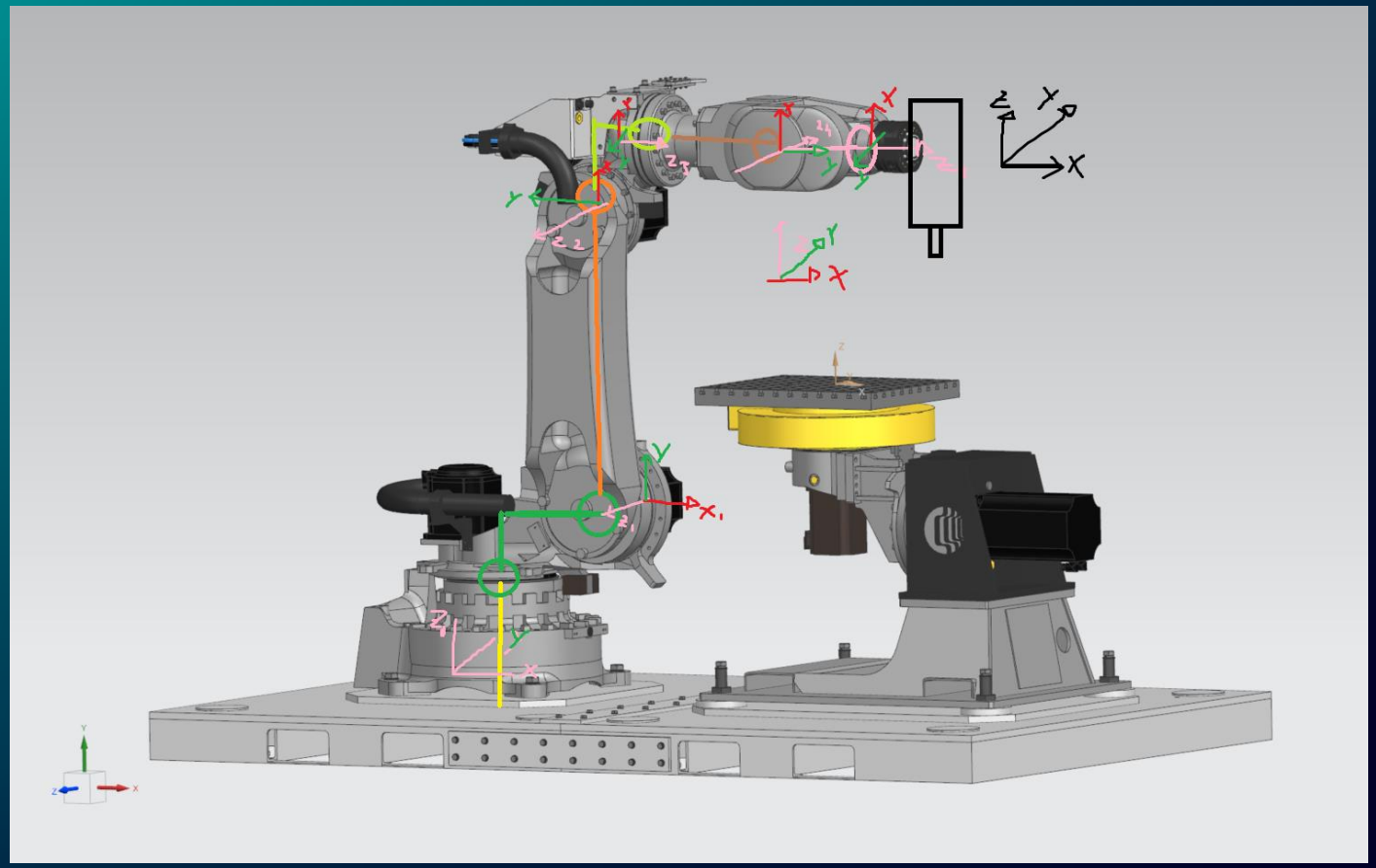
Continuous-path mode ???
Changes: -
-
-
-

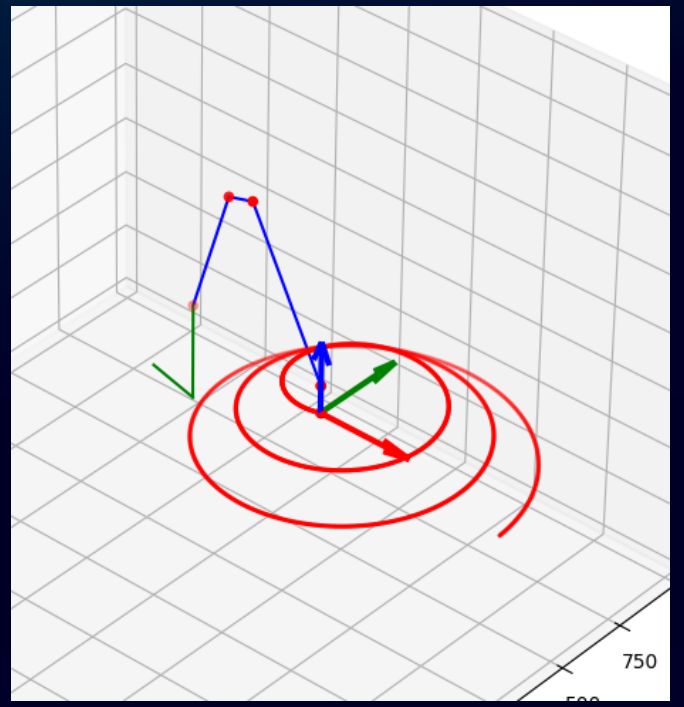
G-Code ??
Add / No Add

Writing progress

Methodology == Done ☺

Robot Problems





DH parameters ?!?!?

Correct inverse kinematic algorithm ? – work in progress

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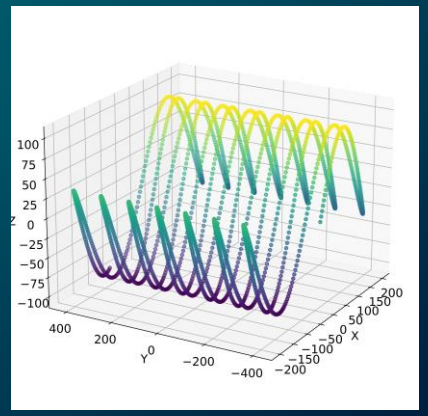
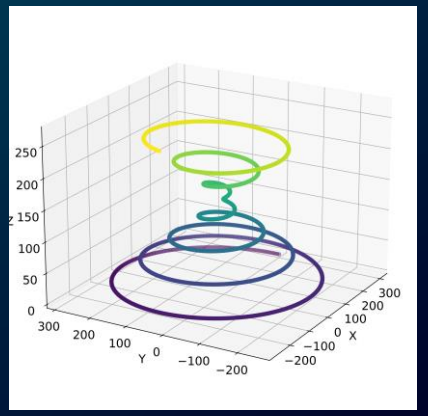
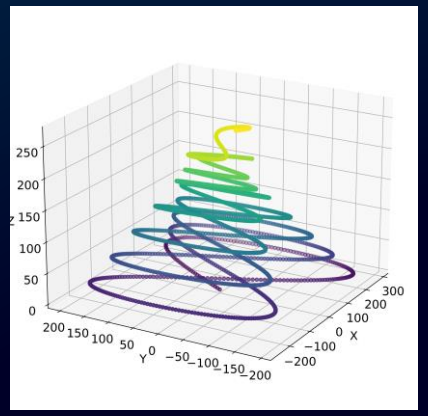
Python progress:

Toolpath_Generator.py







Backwards lib.py

```
from visual_kinematics.RobotSerial import *
```

movement.py

Joint_Analyzer.py

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NX Problems

test_robot_axis.txt - Notepad

File Edit Format View Help

```
kim 561> Axes J1 25.2046 J2 37.9078 J3 21.2463 J4 43.7646 J5 -96.9489 J6 -119.2460 POSITIONER_A1_AXIS
kim 562> Axes J1 25.2094 J2 37.9745 J3 20.8373 J4 43.7238 J5 -96.6084 J6 -119.5805 POSITIONER_A1_AXIS
kim 563> Axes J1 25.2138 J2 38.0460 J3 20.4354 J4 43.6852 J5 -96.2690 J6 -119.9129 POSITIONER_A1_AXIS
kim 564> Axes J1 25.2180 J2 38.1224 J3 20.0403 J4 43.6488 J5 -95.9308 J6 -120.2431 POSITIONER_A1_AXIS
kim 565> Axes J1 25.2220 J2 38.2035 J3 19.6520 J4 43.6146 J5 -95.5936 J6 -120.5714 POSITIONER_A1_AXIS
kim 566> Axes J1 25.2257 J2 38.2893 J3 19.2704 J4 43.5826 J5 -95.2576 J6 -120.8977 POSITIONER_A1_AXIS
kim 567> Axes J1 25.2291 J2 38.3797 J3 18.8955 J4 43.5526 J5 -94.9226 J6 -121.2220 POSITIONER_A1_AXIS
kim 568> Axes J1 25.2323 J2 38.4747 J3 18.5271 J4 43.5248 J5 -94.5887 J6 -121.5446 POSITIONER_A1_AXIS
kim 569> Axes J1 25.2352 J2 38.5742 J3 18.1650 J4 43.4991 J5 -94.2559 J6 -121.8653 POSITIONER_A1_AXIS
kim 570> Axes J1 25.2379 J2 38.6782 J3 17.8093 J4 43.4754 J5 -93.9241 J6 -122.1843 POSITIONER_A1_AXIS
kim 571> Axes J1 25.2404 J2 38.7866 J3 17.4599 J4 43.4537 J5 -93.5935 J6 -122.5016 POSITIONER_A1_AXIS
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kim 573> Axes J1 25.2446 J2 39.0165 J3 16.7796 J4 43.4163 J5 -92.9353 J6 -123.1312 POSITIONER_A1_AXIS
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kim 576> Axes J1 25.2492 J2 39.3932 J3 15.8044 J4 43.3747 J5 -91.9559 J6 -124.0639 POSITIONER_A1_AXIS
kim 577> Axes J1 25.2503 J2 39.5271 J3 15.4912 J4 43.3646 J5 -91.6316 J6 -124.3718 POSITIONER_A1_AXIS
kim 578> Axes J1 25.2512 J2 39.6652 J3 15.1838 J4 43.3563 J5 -91.3082 J6 -124.6783 POSITIONER_A1_AXIS
```

Values do exist
BUT
Only as a Debug-Variable – only in development version of NX

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Christmas planning

DATE:	Ludwig	Marius	Jan
08.12			☺
15.12			☺
22.12			☺
29.12	X		☺
05.01			☺
12.01			☺
19.01			X
26.01			X
02.02			☺

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ToDo:

Einheiten in img

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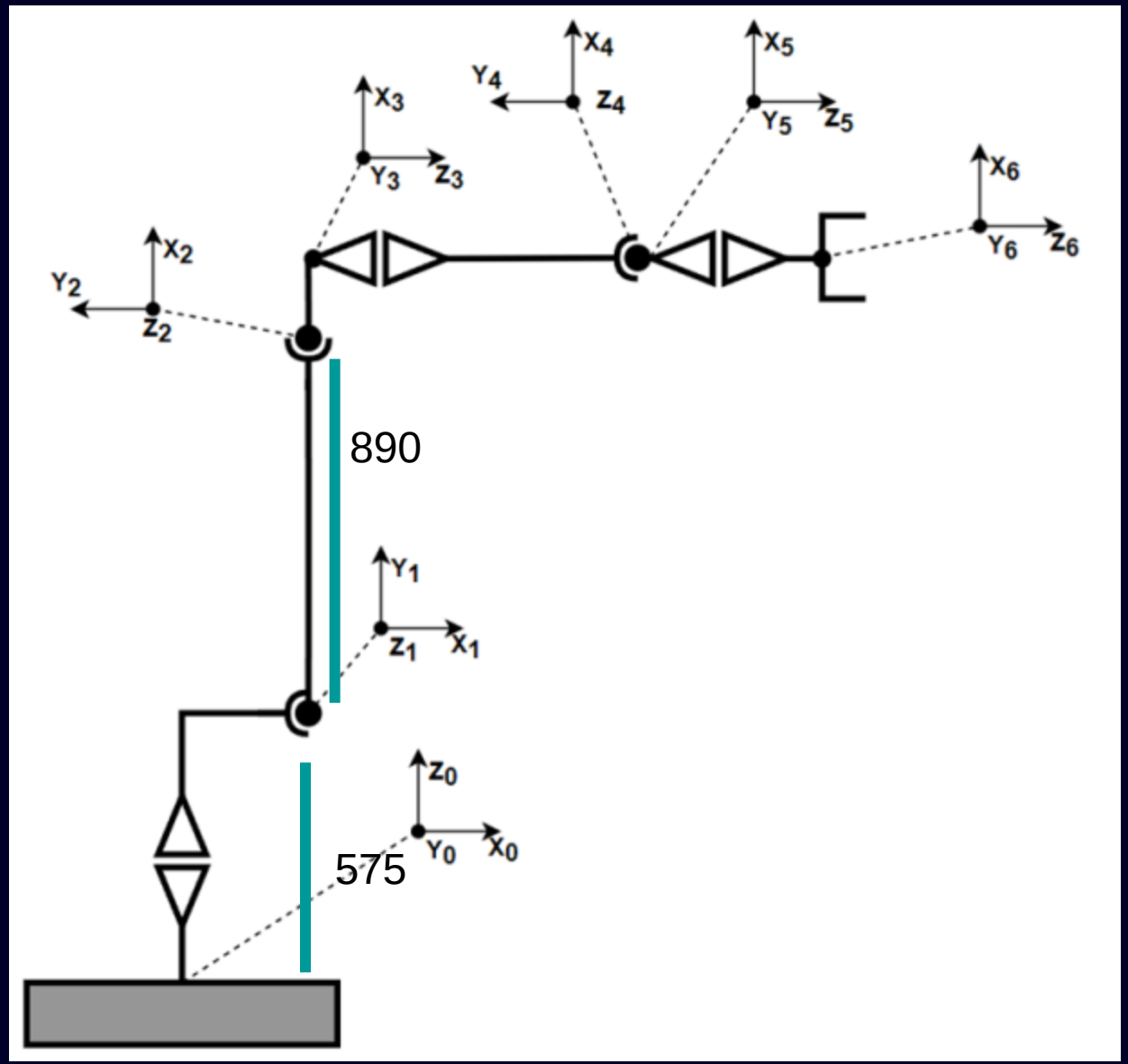

	$\theta°_h$	α°	d(mm)	a(mm)
1st Joint	0	90	575	175
2nd Joint	90	0	0	890
3rd Joint	0	90	0	50
4th Joint	0	-90	1035	0
5th Joint	0	90	0	0
6th Joint	0	0	185	0