# PrecisionCAT GitHub Information

**Defining the Relationship Between Stress from**

**Graspers and Bowel Injury in Humans to Establish**

**Intraoperative Force Boundaries**

Khan, Amanda; University of Toronto - Institute of Biomaterials and Biomedical Engineering

MacDonald, Matthew; CIGITI – Hospital for Sick Children, Toronto, ON

Doshi, Sachin; CIGITI – Hospital for Sick Children, Toronto, ON

Streutker, Catherine; University of Toronto Department of Laboratory Medicine and Pathobiology

Rowsell, Corwyn; University of Toronto Department of Laboratory Medicine and Pathobiology

Drake, James; Hospital For Sick Children, Surgery, Neurosurgery, Toronto, ON

Grantcharov, Teodor; University of Toronto Department of Surgery

\* Materials and correspondence to: Amanda Farah Khan, [amy.khan@mail.utoronto.ca](mailto:amy.khan@mail.utoronto.ca)

# Read Me

All SolidWorks and .stl CAD files necessary to manufacture and recreate the PrecisionCAT along with the full Python code necessary to interact with the controller and experimental protocol is located on GitHub and is licensed under the MIT Open Source Initiative:

<https://github.com/crushdevice>

Load all part files in the PrecisionCAT folder with the main SolidWorks assembly file “PrecisionCATASSEMBLY.SLDASM”.

# Build of Materials

|  |  |  |
| --- | --- | --- |
| Part | Description | Product Code |
| SMAC Linear Actuator | 25 mm stroke; 48 volts | <https://www.smac-mca.com/lca-series-p-15.html?cPath=1_4>  LCA 50-025-72-1F-3 |
| Power Supply | 48 volt | Generic |
| Omega Load Cell | Miniature universal load cell with ±5 kgF range | <https://www.omega.com/pptst/LCM703.html>  LCM703-5 |
| LAC-1 Controller | Single axis controller;  12-48 volts | <https://www.smac-mca.com/lac-single-axis-controller-p-127.html> |
| LAC-1 Communication Kit | Used for interfacing with the controller | Bundled with LAC-1 Controller |
| Omega Load Cell Strain Gage Amplifier | Bridge excitation of 4 to 15 volts; adjustable gain and offset | <https://www.omega.ca/en/communication-and-connectivity/signal-conditioners-and-transmitters/signal-conditioners/dmd-465-series/p/DMD-465>  DMD-465 |
| End-Feed Fastener | M6 thread for 30 mm high rail T-slotted framing | <https://www.mcmaster.com/5537t527>  McMaster-Carr part 5537T527 |
| T-Slotted Framing Single Rail | 1 ft; 30 mm x 30 mm | <https://www.mcmaster.com/5537t97>  McMaster-Carr part 5537T97 |
| T-Slotted Framing Corner Brackets | For 30 mm | <https://www.mcmaster.com/5537t936>  McMaster-Carr part 5537T936 |
| 316 Stainless Steel Threaded Rod (20 mm) | M6; 1 mm x 20 mm | <https://www.mcmaster.com/98863a243>  McMaster-Carr part 98863A243 |
| 316 Stainless Steel Threaded Rod (40 mm) | M6; 1 mm x 40 mm | <https://www.mcmaster.com/98863a260>  McMaster-Carr part 98863A260 |
| 316 Stainless Steel Thin Hex Nut (M6) | M6; 1 mm | <https://www.mcmaster.com/93935a335>  McMaster-Carr part 93935A335 |
| 316 Stainless Steel Thin Hex Nut (M3) | M3; 0.5 mm | <https://www.mcmaster.com/93935a320>  McMaster-Carr part 93935A320 |
| Aluminum Plate | 6061 aluminum | Custom milled |