Adapting 3D Printer Technology for QA of Gammaknife Icon High Definition Motion Management System

Kevin K. Grantham, Ning J. Yue, Ke Nie

Rutgers-Cancer Institute of New Jersey, Rutgers-Robert Wood Johnson Medical School, New Brunswick, NJ

Abstract ID: 40785
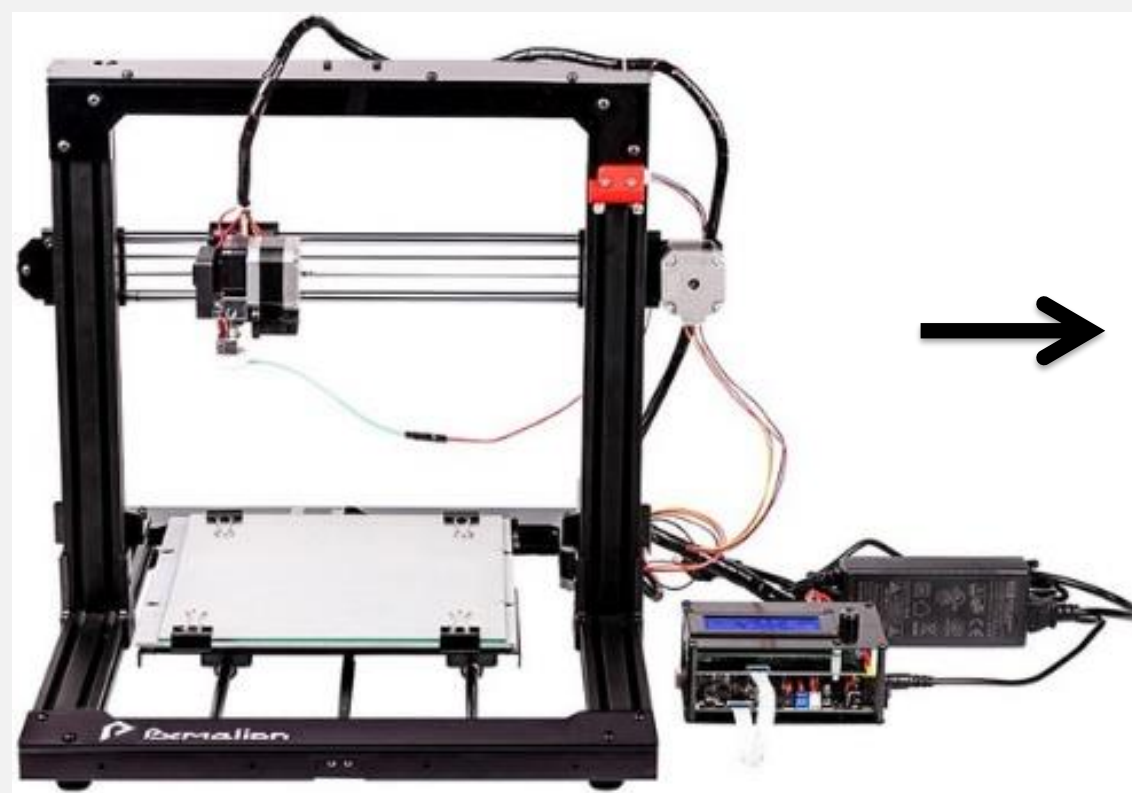Session Title: New QA and Dosimetry Techniques
Date and Time: 08/01/2018 10:15AM — 12:15PM
Presenting Author: Kevin Grantham

The vendor provides no solution to verify the accuracy of the HDMM. Here we build a programmable motion platform that. We achieve this goal by modifying the construction of an inexpensive 3-D printer kit.

Starting point:

- Remove Extruder.
- Move vertical frame from base onto the movable carriage.
- Reduce size of base such that it will fit on Frameless Head Support.
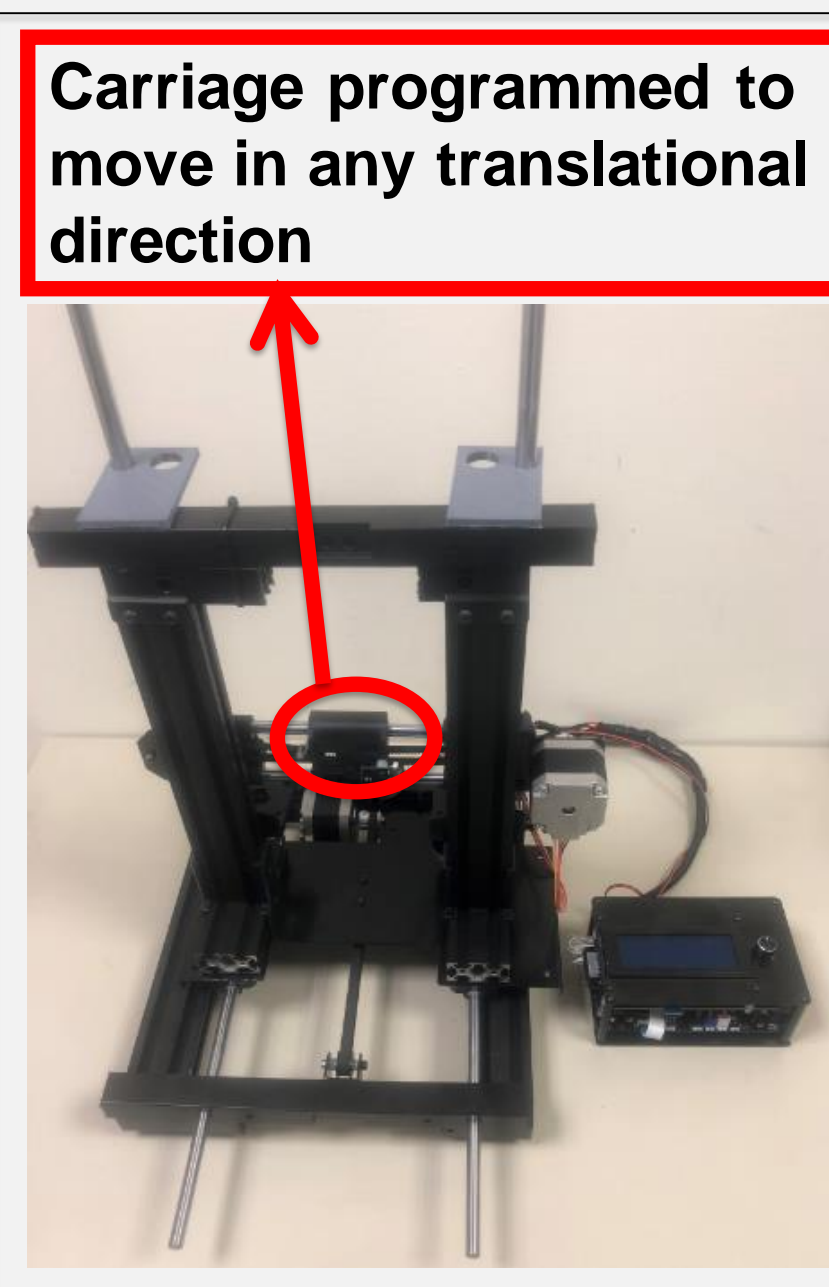
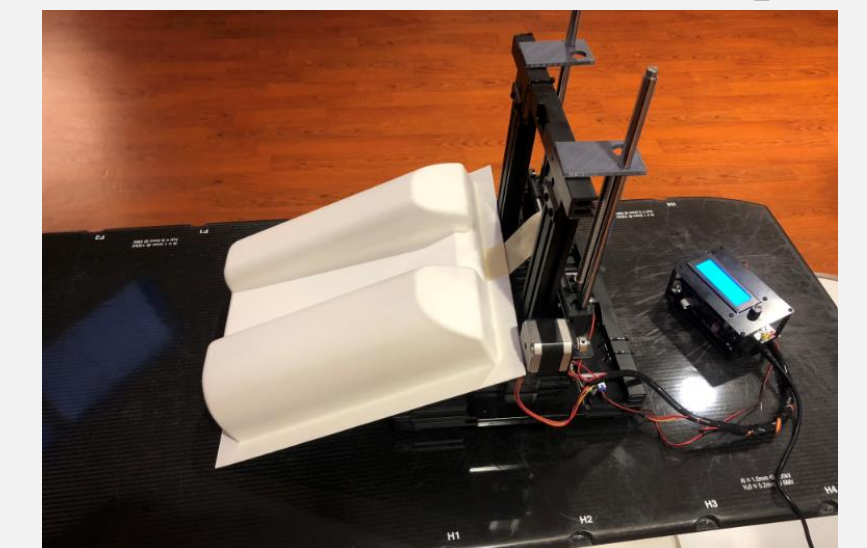Carriage programmed to move in any translational direction

Gamma Knife Setup and Initial Measurement

Initial tests show the motion detected by the HDMM agrees with the programmed motion within 0.3 mm.

The utility of this motion platform is not limited to testing the Gamma Knife HDMM. It can also be used to verify the detection accuracy for other motion management platforms (VisionRT and RPM shown here).

VisionRT Setup

RPM Setup and Measurement