EM tracker base (fixed in workspace)

Goal is to find this
Optical tracker (on tripod)  \( F_D \)  EM tracker base (fixed in workspace)

Workspace

Calibration object (moves in workspace)

EM markers

LEDs

Solve for \( F_A \) as point cloud to point cloud registration problem from \( \hat{A}_j = F_A \hat{a}_j \)

\( \hat{a} \)

\( \hat{c}_i \)

\( \hat{c}_j \)

\( D_i \)

\( \mathbf{d} = F_c \hat{d}_j \)

5

6
Defining the EM rigid body

\[ \vec{g}_j = \vec{G}_j - \vec{G}_0 \]

\[ \vec{G}_0 = \frac{1}{N_0} \sum \vec{G}_j \]

Calibrating the EM Pointer (pivot calibration)

Solve for \( F_j[k] \) such that

\[ \vec{G}_j^{(k)} = F_j[k] \bullet \vec{g}_j \]

Then solve least squares problem

\[ \vec{P}_{\text{dimple}} = F_j[k] \bullet \vec{t}_u \]

Calibrating optical pointer is similar except use \( \vec{P}_j = F_j \bullet H_j \) instead of \( \vec{G}_j \)
Goal is to find this

- LEDs
- EM markers

Workspace

EM tracker base (fixed in workspace)