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In[80]:= Manipulate[
  (*by Nasser M. Abbasi 6/30/14*)
  tick;
  Module[{perc, torque, g = 9.81, I0, w = 2.0 Pi * spin, delTheta = 2.0 Pi / 10, u},
    torque = g * r2;
    I0 = r1^2;
    perc = torque / (I0 * w);
    thick = 0.07 r1;
    spins = Table[{{r2, 0, 0}, {r2, r1 Cos[x], r1 Sin[x]}}, {x, 0., 2 Pi, 2 Pi / n}];
    topSpins = Table[{{0, 0, 2}, {0.4 Cos[x], 0.4 Sin[x], 2}}, {x, 0., 2 Pi, 2 Pi / 10}];
    wheel = Table[{r2, r1 Cos[u], r1 Sin[u]}, {u, 0., 2 Pi, 2 Pi / 40}];
    topWheel = Table[{0.4 Cos[u], 0.4 Sin[u], 2}, {u, 0., 2 Pi, 2 Pi / 40}];

    g =
    Grid[{
      {Grid[{
        {"wheel angle", "precession angle", "wheel spin (hz)", "Precession spin (hz)"},
        {
          padIt2[currentSpinAngle * 180 / Pi, {4, 3}],
          padIt2[currentPercAngle * 180 / Pi, {4, 3}],
          padIt1[w / (2 Pi), {5, 4}],
          padIt1[perc / (2 Pi), {5, 4}]
        }
      }, Alignment -> Center, Frame -> All, Spacings -> {.5, .7}]
    },
    {Graphics3D[
      Rotate[GraphicsGroup[
        {
          Rotate[GraphicsGroup[
            {{Green, Tube[wheel, thick]},
            {Red, Cylinder[{{r2 - thick, 0, 0}, {r2 + thick, 0, 0}], thick}},
            (*disk in middle of wheel*)
            Tube[#, thick / 3] & /@ spins(*rods*)
          ]}],
          currentSpinAngle, {1, 0, 0}
        ],
        {Arrowheads[Small],
          Arrow[{{r2, 0, 0}, {r2, If[clockWise, -1, 1] 1.5 r1, 0}}], (*torque*)
          Text[Style["torque", Bold, 10], {r2, If[clockWise, -1, 1] 1.5 r1 +
            If[clockWise, -1, 1] * 0.3 r1, 0}],
          {Arrowheads[Small], Arrow[{{0, 0, 0}, {If[clockWise, -r1, r2 + r1], 0, 0}}],
            (*angular momentum*)
          Text[Style["H", Bold, 10], {If[clockWise, -1.1 r1, r2 + 1.1 r1], 0, 0}],
          {Blue, Cylinder[{{0, 0, 0}, {r2, 0, 0}], thick}}, (*tube to robe*)
          Tube[{{0, 0, 0}, {0, 0, 2}}, thick / 2], (*robe*)
          {LightGray,
            Cylinder[{{0, 0, 2 - 0.03}, {0, 0, 2 - 0.01}}, 0.4]}, (*disk at top*)
          Tube[topWheel, 0.01],
          {Red, Tube[#, 0.01] & /@ topSpins}
        ]], currentPercAngle, {0, 0, 1}],

      Axes -> False, AxesLabel -> {"x", "y", "z"},

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    PlotRange → {{-zoom, zoom}, {-zoom, zoom}, {-1.1, 2.1}},
    SphericalRegion → True, Boxed → False, ImagePadding → .1, ImageSize → 400
  ]
}}, Frame → True, FrameStyle → LightGray];

Which[state == "RUN" || state == "STEP",
  currentSpinAngle = Mod[currentSpinAngle + If[clockWise, -1, 1] delTheta, 2 Pi];
  currentPercAngle =
    Mod[currentPercAngle + If[clockWise, -1, 1] (delTheta * perc / w), 2 Pi];
  If[state == "RUN", tick = Not[tick]]
];
g
],

Grid[{
  {Grid[{
    {Button[Text@Style["run", 12],
      {state == "RUN"; tick == Not[tick]}, ImageSize → {40, 40}],
    Button[Text@Style["step", 12], {state == "STEP"; tick == Not[tick]},
      ImageSize → {40, 40}],
    Button[Text@Style["stop", 12], {state == "STOP"; tick == Not[tick]},
      ImageSize → {40, 40}],
    Button[Text@Style["reset", 12], {state == "RESET"; r1 == 1; r2 == 1;
      spin == 2; zoom == 2.2; n == 10; tick == Not[tick]}, ImageSize → {40, 40}]
    ]
  }, Spacings → {.3, 0}, Frame → True, FrameStyle → Gray
  ], SpanFromLeft
},
{
  "radius of wheel", Manipulator[Dynamic[r1, {r1 == #; tick == Not[tick]} &],
    {.2, 1, .1}, ImageSize → Small], Dynamic[padIt1[r1, {2, 1}]]
},
{
  "distance away", Manipulator[Dynamic[r2, {r2 == #; tick == Not[tick]} &],
    {.2, 2, .01}, ImageSize → Small], Dynamic[padIt1[r2, {2, 1}]]
},
{
  "number of rods", Manipulator[Dynamic[n, {n == #; tick == Not[tick]} &],
    {3, 15, 1}, ImageSize → Small], Dynamic[padIt1[n, 2]]
},
{
  "wheel spin (hz)", Manipulator[Dynamic[spin, {spin == #; tick == Not[tick]} &],
    {.1, 5, .1}, ImageSize → Small], Dynamic[padIt1[spin, {2, 1}]]
},
{
  "wheel spin clockwise",
  Checkbox[Dynamic[clockWise, {clockWise == #; tick == Not[tick]} &]]
},
{
  "zoom", Manipulator[Dynamic[zoom, {zoom == #; tick == Not[tick]} &],
    {1, 4, .1}, ImageSize → Small], Dynamic[padIt1[zoom, {2, 1}]]
}
]

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    }, Frame → True, Alignment → Center, FrameStyle → Gray
  ],

  {{tick, False}, None},
  {{r1, 1}, None},
  {{r2, 1}, None},
  {{spin, 2}, None},
  {{zoom, 2.2}, None},
  {{n, 10}, None},
  {{state, "STOP"}, None},
  {{clockWise, True}, None},

  {{currentSpinAngle, 0}, None},
  {{currentPercAngle, 0}, None},

  ControlPlacement → Left, Alignment → Center, ImageMargins → 0, FrameMargins → 0,
  TrackedSymbols → {tick},
  Initialization →
  (
    integerStrictPositive = (IntegerQ[#] && # > 0 &);
    integerPositive = (IntegerQ[#] && # ≥ 0 &);
    numericStrictPositive = (Element[#, Reals] && # > 0 &);
    numericPositive = (Element[#, Reals] && # ≥ 0 &);
    numericStrictNegative = (Element[#, Reals] && # < 0 &);
    numericNegative = (Element[#, Reals] && # ≤ 0 &);
    bool = (Element[#, Booleans] &);
    numeric = (Element[#, Reals] &);
    integer = (Element[#, Integers] &);
    (*-----*)
    padIt1[v_?numeric, f_List] := AccountingForm[v,
      f, NumberSigns → {"-", "+"}, NumberPadding → {"0", "0"}, SignPadding → True];
    (*-----*)
    padIt1[v_?numeric, f_Integer] := AccountingForm[Chop[v],
      f, NumberSigns → {"-", "+"}, NumberPadding → {"0", "0"}, SignPadding → True];
    (*-----*)
    padIt2[v_?numeric, f_List] := AccountingForm[v,
      f, NumberSigns → {"", ""}, NumberPadding → {"0", "0"}, SignPadding → True];
    (*-----*)
    padIt2[v_?numeric, f_Integer] := AccountingForm[Chop[v],
      f, NumberSigns → {"", ""}, NumberPadding → {"0", "0"}, SignPadding → True];
    (*-----*)
  )
]

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