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classdef jurp_app_V2_exported < matlab.apps.AppBase

    % Properties that correspond to app components
    properties (Access = public)
        UIFigure                    matlab.ui.Figure
        TabGroup                    matlab.ui.container.TabGroup
        MotionControlTab            matlab.ui.container.Tab
        MotionControllerLabel        matlab.ui.control.Label
        HomeButton                  matlab.ui.control.Button
        SimultaneouscommandsPanel    matlab.ui.container.Panel
        ShoulderEditField
        matlab.ui.control.NumericEditField
        ShoulderEditFieldLabel        matlab.ui.control.Label
        TransverseEditField
        matlab.ui.control.NumericEditField
        TransverseEditFieldLabel        matlab.ui.control.Label
        ElbowEditField
        matlab.ui.control.NumericEditField
        ElbowEditFieldLabel            matlab.ui.control.Label
        PublishButton                matlab.ui.control.StateButton
        IndividualcommandsPanel        matlab.ui.container.Panel
        ShoulderSpinner              matlab.ui.control.Spinner
        TransverseSpinner            matlab.ui.control.Spinner
        ElbowSpinner                 matlab.ui.control.Spinner
        ShoulderradSliderLabel        matlab.ui.control.Label
        ShoulderradSlider            matlab.ui.control.Slider
        TransverseradSliderLabel        matlab.ui.control.Label
        TransverseradSlider          matlab.ui.control.Slider
        ElbowradSliderLabel           matlab.ui.control.Label
        ElbowradSlider               matlab.ui.control.Slider
        StartButton                  matlab.ui.control.Button
        JuggleLifeTab                matlab.ui.container.Tab
        JuggleLifeLabel              matlab.ui.control.Label
        InitialpositionPanel          matlab.ui.container.Panel
        ShoulderEditField_5
        matlab.ui.control.NumericEditField
        ShoulderEditField_5Label        matlab.ui.control.Label
        TransverseEditField_5
        matlab.ui.control.NumericEditField
        TransverseEditField_5Label        matlab.ui.control.Label
        ElbowEditField_5
        matlab.ui.control.NumericEditField
        ElbowEditField_5Label            matlab.ui.control.Label
        GoButton_2                   matlab.ui.control.StateButton
        TossCatchButton              matlab.ui.control.Button
        HomeButton_3                 matlab.ui.control.Button
        StartButton_2                matlab.ui.control.Button
        CatchingheightEditField_2Label    matlab.ui.control.Label
        CatchingheightEditField_2
        matlab.ui.control.NumericEditField
        JugglecontButton              matlab.ui.control.Button
        FinalpositionPanel            matlab.ui.container.Panel
    end
end

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ShoulderEditField_10	
matlab.ui.control.NumericEditField	
ShoulderEditField_10Label	matlab.ui.control.Label
TransverseEditField_10	
matlab.ui.control.NumericEditField	
TransverseEditField_10Label	matlab.ui.control.Label
ElbowEditField_10	
matlab.ui.control.NumericEditField	
ElbowEditField_10Label	matlab.ui.control.Label
JuggleEstimationTab	matlab.ui.container.Tab
JuggleEstimationLabel	matlab.ui.control.Label
InitialpositionPanel_2	matlab.ui.container.Panel
ShoulderEditField_9	
matlab.ui.control.NumericEditField	
ShoulderEditField_9Label	matlab.ui.control.Label
TransverseEditField_9	
matlab.ui.control.NumericEditField	
TransverseEditField_9Label	matlab.ui.control.Label
ElbowEditField_9	
matlab.ui.control.NumericEditField	
ElbowEditField_9Label	matlab.ui.control.Label
GoButton_3	matlab.ui.control.StateButton
TossCatchButton_2	matlab.ui.control.Button
HomeButton_6	matlab.ui.control.Button
StartButton_5	matlab.ui.control.Button
JugglecontButton_2	matlab.ui.control.Button
CatchingheightEditField_4Label	matlab.ui.control.Label
CatchingheightEditField_4	
matlab.ui.control.NumericEditField	
FinalpositionPanel_2	matlab.ui.container.Panel
ShoulderEditField_11	
matlab.ui.control.NumericEditField	
ShoulderEditField_11Label	matlab.ui.control.Label
TransverseEditField_11	
matlab.ui.control.NumericEditField	
TransverseEditField_11Label	matlab.ui.control.Label
ElbowEditField_11	
matlab.ui.control.NumericEditField	
ElbowEditField_11Label	matlab.ui.control.Label
HumaninteractionTab	matlab.ui.container.Tab
HomeButton_4	matlab.ui.control.Button
StartButton_3	matlab.ui.control.Button
TossingcommandsPanel	matlab.ui.container.Panel
ShoulderEditField_8	
matlab.ui.control.NumericEditField	
ShoulderEditField_8Label	matlab.ui.control.Label
TransverseEditField_8	
matlab.ui.control.NumericEditField	
TransverseEditField_8Label	matlab.ui.control.Label
ElbowEditField_8	
matlab.ui.control.NumericEditField	
ElbowEditField_8Label	matlab.ui.control.Label
TossButton	matlab.ui.control.StateButton
HomeButton_5	matlab.ui.control.Button

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StartButton_4	matlab.ui.control.Button
InteractButton	matlab.ui.control.Button
LivecatchingcommandsPanel	matlab.ui.container.Panel
LimitxminEditField	
matlab.ui.control.NumericEditField	
LimitxminEditFieldLabel	matlab.ui.control.Label
LimityminEditField	
matlab.ui.control.NumericEditField	
LimityminEditFieldLabel	matlab.ui.control.Label
CatchingheightEditField_3	
matlab.ui.control.NumericEditField	
CatchingheightEditField_3Label	matlab.ui.control.Label
CatchButton_2	matlab.ui.control.StateButton
LimitxmaxEditField	
matlab.ui.control.NumericEditField	
LimitxmaxEditFieldLabel	matlab.ui.control.Label
LimitymaxEditField	
matlab.ui.control.NumericEditField	
LimitymaxEditFieldLabel	matlab.ui.control.Label
CatchingtimeEditField	
matlab.ui.control.NumericEditField	
CatchingtimeEditFieldLabel	matlab.ui.control.Label
LimitzEditField	
matlab.ui.control.NumericEditField	
LimitzEditFieldLabel	matlab.ui.control.Label
HumaninteractionLabel	matlab.ui.control.Label
EstimationcatchingcommandsPanel	matlab.ui.container.Panel
SamplingthEditField	
matlab.ui.control.NumericEditField	
SamplingthEditFieldLabel	matlab.ui.control.Label
CatchheightEditField	
matlab.ui.control.NumericEditField	
CatchheightEditFieldLabel	matlab.ui.control.Label
CatchButton_3	matlab.ui.control.StateButton
HardcodedJuggleTab	matlab.ui.container.Tab
StartPanel	matlab.ui.container.Panel
ShoulderEditField_2	
matlab.ui.control.NumericEditField	
ShoulderEditField_2Label	matlab.ui.control.Label
TransverseEditField_2	
matlab.ui.control.NumericEditField	
TransverseEditField_2Label	matlab.ui.control.Label
ElbowEditField_2	
matlab.ui.control.NumericEditField	
ElbowEditField_2Label	matlab.ui.control.Label
TossPanel	matlab.ui.container.Panel
ShoulderEditField_3	
matlab.ui.control.NumericEditField	
ShoulderEditField_3Label	matlab.ui.control.Label
TransverseEditField_3	
matlab.ui.control.NumericEditField	
TransverseEditField_3Label	matlab.ui.control.Label
ElbowEditField_3	
matlab.ui.control.NumericEditField	

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ElbowEditField_3Label	matlab.ui.control.Label
CatchPanel	matlab.ui.container.Panel
ShoulderEditField_4	
matlab.ui.control.NumericEditField	
ShoulderEditField_4Label	matlab.ui.control.Label
TransverseEditField_4	
matlab.ui.control.NumericEditField	
TransverseEditField_4Label	matlab.ui.control.Label
ElbowEditField_4	
matlab.ui.control.NumericEditField	
ElbowEditField_4Label	matlab.ui.control.Label
JuggleButton	matlab.ui.control.Button
GotostartButton	matlab.ui.control.Button
IKTab	matlab.ui.container.Tab
TestIKPanel	matlab.ui.container.Panel
ShoulderEditField_6Label	matlab.ui.control.Label
ShoulderEditField_6	
matlab.ui.control.NumericEditField	
TransverseEditField_6Label	matlab.ui.control.Label
TransverseEditField_6	
matlab.ui.control.NumericEditField	
ElbowEditField_6Label	matlab.ui.control.Label
ElbowEditField_6	
matlab.ui.control.NumericEditField	
CalculateButton	matlab.ui.control.Button
PublishButton_3	matlab.ui.control.Button
CalculatePublishButton	matlab.ui.control.Button
StatusPanel	matlab.ui.container.Panel
AllclearLampLabel	matlab.ui.control.Label
AllclearLamp	matlab.ui.control.Lamp
CatchzoneLampLabel	matlab.ui.control.Label
CatchzoneLamp	matlab.ui.control.Lamp
JointstatesLampLabel	matlab.ui.control.Label
JointstatesLamp	matlab.ui.control.Lamp
CatchPanel_2	matlab.ui.container.Panel
TossingheightEditFieldLabel	matlab.ui.control.Label
TossingheightEditField	
matlab.ui.control.NumericEditField	
CatchingheightEditFieldLabel	matlab.ui.control.Label
CatchingheightEditField	
matlab.ui.control.NumericEditField	
CatchButton	matlab.ui.control.Button
HomeButton_2	matlab.ui.control.Button
GotopointPanel	matlab.ui.container.Panel
xEditFieldLabel	matlab.ui.control.Label
xEditField	
matlab.ui.control.NumericEditField	
yEditFieldLabel	matlab.ui.control.Label
yEditField	
matlab.ui.control.NumericEditField	
zEditFieldLabel	matlab.ui.control.Label
zEditField	
matlab.ui.control.NumericEditField	
GoButton	matlab.ui.control.Button

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        ShoulderEditField_7Label          matlab.ui.control.Label
        ShoulderEditField_7
matlab.ui.control.NumericEditField
        TransverseEditField_7Label        matlab.ui.control.Label
        TransverseEditField_7
matlab.ui.control.NumericEditField
        ElbowEditField_7Label             matlab.ui.control.Label
        ElbowEditField_7
matlab.ui.control.NumericEditField
        FollowBallButton                  matlab.ui.control.Button
    end

    properties (Access = public)
    end

    % Callbacks that handle component events
    methods (Access = private)

        % Code that executes after component creation
        function startupFcn(app)

    end

        % Value changed function: ShoulderradSlider
        function ShoulderradSliderValueChanged(app, event)
            value = app.ShoulderradSlider.Value;
            app.ShoulderSpinner.Value = value;
            app.ShoulderEditField.Value = value;

    end

        % Value changed function: TransverseradSlider
        function TransverseradSliderValueChanged(app, event)
            value = app.TransverseradSlider.Value;
            app.TransverseSpinner.Value = value;
            app.TransverseEditField.Value = value;

    end

        % Value changed function: ElbowradSlider
        function ElbowradSliderValueChanged(app, event)
            value = app.ElbowradSlider.Value;
            app.ElbowSpinner.Value = value;
            app.ElbowradSlider.Value = value;
            app.ElbowEditField.Value = value;

    end

        % Value changed function: ShoulderSpinner

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function ShoulderSpinnerValueChanged(app, event)
    value = app.ShoulderSpinner.Value;
    app.ShoulderradSlider.Value = value;
    app.ShoulderEditField.Value = value;

end

% Value changed function: TransverseSpinner
function TransverseSpinnerValueChanged(app, event)
    value = app.TransverseSpinner.Value;
    app.TransverseradSlider.Value=value;
    app.TransverseEditField.Value = value;

end

% Value changed function: ElbowSpinner
function ElbowSpinnerValueChanged(app, event)
    value = app.ElbowSpinner.Value;
    app.ElbowradSlider.Value=value;
    app.ElbowEditField.Value = value;

end

% Button pushed function: HomeButton
function HomeButtonPushed(app, event)
    app.ShoulderradSlider.Value = 0;
    app.ShoulderSpinner.Value = 0;
    app.ShoulderEditField.Value = 0;
    app.TransverseSpinner.Value = 0;
    app.TransverseradSlider.Value = 0;
    app.TransverseEditField.Value = 0;
    app.ElbowSpinner.Value = pi/2;
    app.ElbowradSlider.Value = pi/2;
    app.ElbowEditField.Value = pi/2;

    publish_motion(0, 0, pi/2);

end

% Value changed function: PublishButton
function PublishButtonValueChanged(app, event)
    value1 = app.ShoulderEditField.Value;
    value2 = app.TransverseEditField.Value;
    value3 = app.ElbowEditField.Value;

    app.ShoulderradSlider.Value = value1;
    app.ShoulderSpinner.Value = value1;
    app.TransverseSpinner.Value = value2;
    app.TransverseradSlider.Value = value2;
    app.ElbowSpinner.Value = value3;
    app.ElbowradSlider.Value = value3;

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        publish_motion(value1, value2, value3);
    end

    % Value changed function: ShoulderEditField
    function ShoulderEditFieldValueChanged(app, event)
        value = app.ShoulderEditField.Value;

    end

    % Value changed function: TransverseEditField
    function TransverseEditFieldValueChanged(app, event)
        value = app.TransverseEditField.Value;

    end

    % Value changed function: ElbowEditField
    function ElbowEditFieldValueChanged(app, event)
        value = app.ElbowEditField.Value;

    end

    % Callback function
    function AnalyzeTabSizeChanged(app, event)

    end

    % Button pushed function: JuggleButton
    function JuggleButtonPushed(app, event)
        toss_value1 = app.ShoulderEditField_3.Value;
        toss_value2 = app.TransverseEditField_3.Value;
        toss_value3 = app.ElbowEditField_3.Value;

        catch_value1 = app.ShoulderEditField_4.Value;
        catch_value2 = app.TransverseEditField_4.Value;
        catch_value3 = app.ElbowEditField_4.Value;

        app.ShoulderradSlider.Value = catch_value1;
        app.ShoulderSpinner.Value = catch_value1;
        app.TransverseSpinner.Value = catch_value2;
        app.TransverseradSlider.Value = catch_value2;
        app.ElbowSpinner.Value = catch_value3;
        app.ElbowradSlider.Value = catch_value3;

        publish_trajectory([toss_value1 catch_value1],
[toss_value2 catch_value2], [toss_value3 catch_value3]);
    end

    % Button pushed function: StartButton
    function StartButtonPushed(app, event)
        app.ShoulderradSlider.Value = 0;
        app.ShoulderSpinner.Value = 0;

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        app.ShoulderEditField.Value = 0;
        app.TransverseSpinner.Value = 0;
        app.TransverseradSlider.Value = 0;
        app.TransverseEditField.Value = 0;
        app.ElbowSpinner.Value = 0;
        app.ElbowradSlider.Value = 0;
        app.ElbowEditField.Value = 0;

        publish_motion(0, 0, 0);
    end

    % Callback function
    function ZeroDANGERButtonPushed(app, event)

    end

    % Value changed function: GoButton_2
    function GoButton_2ValueChanged(app, event)
        value = app.GoButton_2.Value;
        value1 = app.ShoulderEditField_5.Value;
        value2 = app.TransverseEditField_5.Value;
        value3 = app.ElbowEditField_5.Value;

        app.ShoulderradSlider.Value = value1;
        app.ShoulderSpinner.Value = value1;
        app.ShoulderEditField.Value = value1;
        app.TransverseSpinner.Value = value2;
        app.TransverseradSlider.Value = value2;
        app.TransverseEditField.Value = value2;
        app.ElbowSpinner.Value = value3;
        app.ElbowradSlider.Value = value3;
        app.ElbowEditField.Value = value3;

        publish_motion(value1, value2, value3)
    end

    % Button pushed function: GotostartButton
    function GotostartButtonPushed(app, event)
        start_value1 = app.ShoulderEditField_2.Value;
        start_value2 = app.TransverseEditField_2.Value;
        start_value3 = app.ElbowEditField_2.Value;

        app.ShoulderradSlider.Value = start_value1;
        app.ShoulderSpinner.Value = start_value1;
        app.TransverseSpinner.Value = start_value2;
        app.TransverseradSlider.Value = start_value2;
        app.ElbowSpinner.Value = start_value3;
        app.ElbowradSlider.Value = start_value3;

        publish_motion(start_value1, start_value2, start_value3);
    end

    % Callback function

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        function TimingbetweentossandcatchEditFieldValueChanged(app,
event)
            value = app.TimingbetweentossandcatchEditField.Value;
        end

        % Button pushed function: CalculateButton
        function CalculateButtonPushed(app, event)
            pos = track_ball();
            %[jointstates,flag] = ik_solve2(pos);

            jointstates(1) =
app.lookup.ik_lookup{round(pos(1)*100+30),round(pos(2)*100),1};
            jointstates(2) =
app.lookup.ik_lookup{round(pos(1)*100+30),round(pos(2)*100),2};
            jointstates(3) =
app.lookup.ik_lookup{round(pos(1)*100+30),round(pos(2)*100),3};

            app.ShoulderEditField_6.Value = jointstates(1);
            app.TransverseEditField_6.Value= jointstates(2);
            app.ElbowEditField_6.Value= jointstates(3);

            %
            if flag(1) == 0
            %
                app.AllclearLamp.Color = [1 0 0];
            %
            elseif flag(1) == 1
            %
                app.AllclearLamp.Color = [0 1 0];
            %
            end

            %
            if flag(2) == 0
            %
                app.CatchzoneLamp.Color = [1 0 0];
            %
            elseif flag(2) == 1
            %
                app.CatchzoneLamp.Color = [0 1 0];
            %
            end

            %
            if flag(3) == 0
            %
                app.JointstatesLamp.Color = [1 0 0];
            %
            elseif flag(3) == 1
            %
                app.JointstatesLamp.Color = [0 1 0];
            %
            end

        end

        % Value changed function: ShoulderEditField_6
        function ShoulderEditField_6ValueChanged(app, event)
            value = app.ShoulderEditField_6.Value;

        end

        % Button pushed function: PublishButton_3
        function PublishButton_3Pushed(app, event)
            value1 = app.ShoulderEditField_6.Value;
            value2 = app.TransverseEditField_6.Value;
            value3 = app.ElbowEditField_6.Value;
            if app.AllclearLamp.Color == [0 1 0]
                publish_motion(value1, value2, value3);
            end
        end
    end
end

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        end

    end

    % Button pushed function: CalculatePublishButton
    function CalculatePublishButtonPushed(app, event)
        pos = track_ball();
        [JointStates,flag] = ik_solve2(pos);
        [JointStates,flag] = ik_security(JointStates, flag);
        publish_motion(JointStates(1), JointStates(2),
JointStates(3));

        app.ShoulderEditField_6.Value = JointStates(1);
        app.TransverseEditField_6.Value = JointStates(2);
        app.ElbowEditField_6.Value = JointStates(3);

        if flag(1) == 0
            app.AllclearLamp.Color = [1 0 0];
        elseif flag(1) == 1
            app.AllclearLamp.Color = [0 1 0];
        end

        if flag(2) == 0
            app.CatchzoneLamp.Color = [1 0 0];
        elseif flag(2) == 1
            app.CatchzoneLamp.Color = [0 1 0];
        end

        if flag(3) == 0
            app.JointstatesLamp.Color = [1 0 0];
        elseif flag(3) == 1
            app.JointstatesLamp.Color = [0 1 0];
        end
    end

    % Button pushed function: CatchButton
    function CatchButtonPushed(app, event)
        toss_height = app.TossingheightEditField.Value;
        catch_height = app.CatchingheightEditField.Value;
        %catch_ball(sample_th, catch_height)
        %catch_lookup(sample_th,
catch_height,app.lookup.ik_lookup)
        catch_follow(catch_height, toss_height);
    end

    % Button pushed function: HomeButton_2
    function HomeButton_2Pushed(app, event)
        publish_motion(0,0,pi/2);
    end

    % Button pushed function: GoButton
    function GoButtonPushed(app, event)
        pos(1) = app.xEditField.Value;
        pos(2) = app.yEditField.Value;

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        pos(3) = app.zEditField.Value;
        [JointStates,~] = ik_solve(pos);

        app.ShoulderEditField_7.Value = JointStates(1);
        app.TransverseEditField_7.Value = JointStates(2);
        app.ElbowEditField_7.Value = JointStates(3);

        publish_motion(JointStates(1), JointStates(2),
JointStates(3));
    end

    % Button pushed function: FollowBallButton
    function FollowBallButtonPushed(app, event)
        followball()
    end

    % Button pushed function: TossCatchButton
    function TossCatchButtonPushed(app, event)
        jointstates(1) = app.ShoulderEditField_10.Value;
        jointstates(2) = app.TransverseEditField_10.Value;
        jointstates(3) = app.ElbowEditField_10.Value;

        catch_height = app.CatchingheightEditField_2.Value;
        juggle(catch_height, jointstates)
        %juggle_estimation(catch_height)
    end

    % Button pushed function: HomeButton_3
    function HomeButton_3Pushed(app, event)
        publish_motion(0,0,pi/2);
    end

    % Button pushed function: StartButton_2
    function StartButton_2Pushed(app, event)
        publish_motion(0,0,0);
    end

    % Button pushed function: JugglecontButton
    function JugglecontButtonPushed(app, event)
        toss_joints(1) = app.ShoulderEditField_5.Value;
        toss_joints(2) = app.TransverseEditField_5.Value;
        toss_joints(3) = app.ElbowEditField_5.Value;
        catch_height = app.CatchingheightEditField_2.Value;

        final_joints(1) = app.ShoulderEditField_10.Value;
        final_joints(2) = app.TransverseEditField_10.Value;
        final_joints(3) = app.ElbowEditField_10.Value;

        juggle_cont(toss_joints, final_joints, catch_height);
    end

    % Button pushed function: HomeButton_4
    function HomeButton_4Pushed(app, event)
        publish_motion(0,0,pi/2);
    end

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end

% Button pushed function: StartButton_3
function StartButton_3Pushed(app, event)
    publish_motion(0,0,0);
end

% Value changed function: TossButton
function TossButtonValueChanged(app, event)
    jointstate(1) = app.ShoulderEditField_8.Value;
    jointstate(2) = app.TransverseEditField_8.Value;
    jointstate(3) = app.ElbowEditField_8.Value;

    RefPub = rospublisher('reference','geometry_msgs/
Vector3');
    RefMsg = rosmessage('geometry_msgs/Vector3');

    publish_motion(0,0,pi/2);
    publish_motion(0,0,1.2);
    publish_motion(0,0,1);
    publish_motion(0,0,0.9);
    %publish_motion(0,0,0.8);

    RefMsg.X = jointstate(1); RefMsg.Y = jointstate(2);
RefMsg.Z = jointstate(3);
    send(RefPub,RefMsg);
end

% Value changed function: CatchButton_2
function CatchButton_2ValueChanged(app, event)
    limX(1) = app.LimitxminEditField.Value;
    limX(2) = app.LimitxmaxEditField.Value;
    limY(1) = app.LimityminEditField.Value;
    limY(2) = app.LimitymaxEditField.Value;
    %limZ = app.LimitzEditField.Value;
    time = app.CatchingtimeEditField.Value;

    catch_height = app.CatchingheightEditField_3.Value;

    catch_follow(limX, limY, catch_height, time);

end

% Button pushed function: HomeButton_5
function HomeButton_5Pushed(app, event)
    publish_motion(0,0,pi/2);
end

% Button pushed function: StartButton_4
function StartButton_4Pushed(app, event)
    publish_motion(0,0,0);
end

% Value changed function: CatchButton_3

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function CatchButton_3ValueChanged(app, event)
    sample_th = app.SamplingthEditField.Value;
    catch_height = app.CatchheightEditField.Value;
    catch_ball(sample_th, catch_height);
end

% Button pushed function: HomeButton_6
function HomeButton_6Pushed(app, event)
    publish_motion(0,0,pi/2)
end

% Button pushed function: StartButton_5
function StartButton_5Pushed(app, event)
    publish_motion(0,0,0)
end

% Value changed function: GoButton_3
function GoButton_3ValueChanged(app, event)
    value1 = app.ShoulderEditField_9.Value;
    value2 = app.TransverseEditField_9.Value;
    value3 = app.ElbowEditField_9.Value;

    app.ShoulderradSlider.Value = value1;
    app.ShoulderSpinner.Value = value1;
    app.ShoulderEditField.Value = value1;
    app.TransverseSpinner.Value = value2;
    app.TransverseradSlider.Value = value2;
    app.TransverseEditField.Value = value2;
    app.ElbowSpinner.Value = value3;
    app.ElbowradSlider.Value = value3;
    app.ElbowEditField.Value = value3;

    publish_motion(value1, value2, value3)
end

% Button pushed function: TossCatchButton_2
function TossCatchButton_2Pushed(app, event)
    jointstates(1) = app.ShoulderEditField_11.Value;
    jointstates(2) = app.TransverseEditField_11.Value;
    jointstates(3) = app.ElbowEditField_11.Value;

    catch_height = app.CatchingheightEditField_4.Value;
    %juggle(catch_height, jointstates)
    juggle_estimation(catch_height, jointstates)
end

% Button pushed function: JugglecontButton_2
function JugglecontButton_2Pushed(app, event)
    toss_joints(1) = app.ShoulderEditField_9.Value;
    toss_joints(2) = app.TransverseEditField_9.Value;
    toss_joints(3) = app.ElbowEditField_9.Value;
    catch_height = app.CatchingheightEditField_4.Value;

```

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```

        final_joints(1) = app.ShoulderEditField_11.Value;
        final_joints(2) = app.TransverseEditField_11.Value;
        final_joints(3) = app.ElbowEditField_11.Value;

        catch_height = app.CatchingheightEditField_4.Value;

        juggle_cont_estim(toss_joints, final_joints,
catch_height);
    end
end

% Component initialization
methods (Access = private)

    % Create UIFigure and components
    function createComponents(app)

        % Create UIFigure and hide until all components are
created
        app UIFigure = uifigure('Visible', 'off');
        app UIFigure.Position = [100 100 634 471];
        app UIFigure.Name = 'UI Figure';

        % Create TabGroup
        app.TabGroup = uitabgroup(app UIFigure);
        app.TabGroup.Position = [2 4 630 468];

        % Create MotionControlTab
        app.MotionControlTab = uitab(app.TabGroup);
        app.MotionControlTab.Title = 'Motion Control';

        % Create MotionControllerLabel
        app.MotionControllerLabel = uilabel(app.MotionControlTab);
        app.MotionControllerLabel.FontSize = 20;
        app.MotionControllerLabel.FontWeight = 'bold';
        app.MotionControllerLabel.Position = [197 410 172 24];
        app.MotionControllerLabel.Text = 'Motion Controller';

        % Create HomeButton
        app.HomeButton = uibutton(app.MotionControlTab, 'push');
        app.HomeButton.ButtonPushedFcn = createCallbackFcn(app,
@HomeButtonPushed, true);
        app.HomeButton.Position = [510 74 100 22];
        app.HomeButton.Text = 'Home';

        % Create SimultaneouscommandsPanel
        app.SimultaneouscommandsPanel =
uipanel(app.MotionControlTab);
        app.SimultaneouscommandsPanel.Title = 'Simultaneous
commands';
        app.SimultaneouscommandsPanel.Position = [8 10 204 161];

        % Create ShoulderEditField

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```

        app.ShoulderEditField =
uieditfield(app.SimultaneouscommandsPanel, 'numeric');
        app.ShoulderEditField.Limits = [-1.5708 1.5708];
        app.ShoulderEditField.ValueChangedFcn =
createCallbackFcn(app, @ShoulderEditFieldValueChanged, true);
        app.ShoulderEditField.Position = [83 110 100 22];

        % Create ShoulderEditFieldLabel
        app.ShoulderEditFieldLabel =
uilabel(app.SimultaneouscommandsPanel);
        app.ShoulderEditFieldLabel.HorizontalAlignment = 'right';
        app.ShoulderEditFieldLabel.Position = [8 110 54 22];
        app.ShoulderEditFieldLabel.Text = 'Shoulder';

        % Create TransverseEditField
        app.TransverseEditField =
uieditfield(app.SimultaneouscommandsPanel, 'numeric');
        app.TransverseEditField.Limits = [-0.8 0.8];
        app.TransverseEditField.ValueChangedFcn =
createCallbackFcn(app, @TransverseEditFieldValueChanged, true);
        app.TransverseEditField.Position = [83 76 100 22];

        % Create TransverseEditFieldLabel
        app.TransverseEditFieldLabel =
uilabel(app.SimultaneouscommandsPanel);
        app.TransverseEditFieldLabel.HorizontalAlignment
= 'right';
        app.TransverseEditFieldLabel.Position = [8 76 65 22];
        app.TransverseEditFieldLabel.Text = 'Transverse';

        % Create ElbowEditField
        app.ElbowEditField =
uieditfield(app.SimultaneouscommandsPanel, 'numeric');
        app.ElbowEditField.Limits = [0 2.35];
        app.ElbowEditField.ValueChangedFcn =
createCallbackFcn(app, @ElbowEditFieldValueChanged, true);
        app.ElbowEditField.Position = [83 43 100 22];

        % Create ElbowEditFieldLabel
        app.ElbowEditFieldLabel =
uilabel(app.SimultaneouscommandsPanel);
        app.ElbowEditFieldLabel.HorizontalAlignment = 'right';
        app.ElbowEditFieldLabel.Position = [8 43 38 22];
        app.ElbowEditFieldLabel.Text = 'Elbow';

        % Create PublishButton
        app.PublishButton =
uibutton(app.SimultaneouscommandsPanel, 'state');
        app.PublishButton.ValueChangedFcn = createCallbackFcn(app,
@PublishButtonValueChanged, true);
        app.PublishButton.Text = 'Publish';
        app.PublishButton.Position = [84 8 100 22];

        % Create IndividualcommandsPanel

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```

        app.IndividualcommandsPanel =
uipanel(app.MotionControlTab);
        app.IndividualcommandsPanel.Title = 'Individual commands';
        app.IndividualcommandsPanel.Position = [8 182 625 210];

        % Create ShoulderSpinner
        app.ShoulderSpinner =
uispinner(app.IndividualcommandsPanel);
        app.ShoulderSpinner.Step = 0.1;
        app.ShoulderSpinner.Limits = [-1.5708 1.5708];
        app.ShoulderSpinner.ValueChangedFcn =
createCallbackFcn(app, @ShoulderSpinnerValueChanged, true);
        app.ShoulderSpinner.Position = [511 159 100 22];

        % Create TransverseSpinner
        app.TransverseSpinner =
uispinner(app.IndividualcommandsPanel);
        app.TransverseSpinner.Step = 0.1;
        app.TransverseSpinner.Limits = [-3.1416 3.1416];
        app.TransverseSpinner.ValueChangedFcn =
createCallbackFcn(app, @TransverseSpinnerValueChanged, true);
        app.TransverseSpinner.Position = [511 96 100 22];

        % Create ElbowSpinner
        app.ElbowSpinner = uispinner(app.IndividualcommandsPanel);
        app.ElbowSpinner.Step = 0.1;
        app.ElbowSpinner.Limits = [0 2.35];
        app.ElbowSpinner.ValueChangedFcn = createCallbackFcn(app,
@ElbowSpinnerValueChanged, true);
        app.ElbowSpinner.Position = [511 35 100 22];

        % Create ShoulderradSliderLabel
        app.ShoulderradSliderLabel =
uilabel(app.IndividualcommandsPanel);
        app.ShoulderradSliderLabel.HorizontalAlignment = 'right';
        app.ShoulderradSliderLabel.Position = [8 159 82 22];
        app.ShoulderradSliderLabel.Text = 'Shoulder (rad)';

        % Create ShoulderradSlider
        app.ShoulderradSlider =
uislider(app.IndividualcommandsPanel);
        app.ShoulderradSlider.Limits = [-1.5707963267949
1.5707963267949];
        app.ShoulderradSlider.MajorTicks = [-1.5707963267949
1.5707963267949];
        app.ShoulderradSlider.ValueChangedFcn =
createCallbackFcn(app, @ShoulderradSliderValueChanged, true);
        app.ShoulderradSlider.MinorTicks = 0;
        app.ShoulderradSlider.Position = [125 169 335 3];

        % Create TransverseradSliderLabel
        app.TransverseradSliderLabel =
uilabel(app.IndividualcommandsPanel);

```

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```

        app.TransverseradSliderLabel.HorizontalAlignment
= 'right';
        app.TransverseradSliderLabel.Position = [8 96 94 22];
        app.TransverseradSliderLabel.Text = 'Transverse (rad)';

        % Create TransverseradSlider
        app.TransverseradSlider =
uislider(app.IndividualcommandsPanel);
        app.TransverseradSlider.Limits = [-0.8 0.8];
        app.TransverseradSlider.MajorTicks = [-0.8 0.8];
        app.TransverseradSlider.ValueChangedFcn =
createCallbackFcn(app, @TransverseradSliderValueChanged, true);
        app.TransverseradSlider.MinorTicks = 0;
        app.TransverseradSlider.Position = [126 106 335 3];

        % Create ElbowradSliderLabel
        app.ElbowradSliderLabel =
uilabel(app.IndividualcommandsPanel);
        app.ElbowradSliderLabel.HorizontalAlignment = 'right';
        app.ElbowradSliderLabel.Position = [13 37 67 22];
        app.ElbowradSliderLabel.Text = 'Elbow (rad)';

        % Create ElbowradSlider
        app.ElbowradSlider =
uislider(app.IndividualcommandsPanel);
        app.ElbowradSlider.Limits = [0 2.35];
        app.ElbowradSlider.MajorTicks = [0 1.5707963267949 2.35];
        app.ElbowradSlider.ValueChangedFcn =
createCallbackFcn(app, @ElbowradSliderValueChanged, true);
        app.ElbowradSlider.MinorTicks = 0;
        app.ElbowradSlider.Position = [123 47 339 3];

        % Create StartButton
        app.StartButton = uibutton(app.MotionControlTab, 'push');
        app.StartButton.ButtonPushedFcn = createCallbackFcn(app,
@StartButtonPushed, true);
        app.StartButton.Position = [510 41 100 22];
        app.StartButton.Text = 'Start';

        % Create JuggleLifeTab
        app.JuggleLifeTab = uitab(app.TabGroup);
        app.JuggleLifeTab.Title = 'Juggle Life';

        % Create JuggleLifeLabel
        app.JuggleLifeLabel = uilabel(app.JuggleLifeTab);
        app.JuggleLifeLabel.FontSize = 20;
        app.JuggleLifeLabel.FontWeight = 'bold';
        app.JuggleLifeLabel.Position = [280 419 111 24];
        app.JuggleLifeLabel.Text = 'Juggle Life';

        % Create InitialpositionPanel
        app.InitialpositionPanel = uipanel(app.JuggleLifeTab);
        app.InitialpositionPanel.Title = 'Initial position';
        app.InitialpositionPanel.Position = [17 233 204 161];

```

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```

        % Create ShoulderEditField_5
        app.ShoulderEditField_5 =
uieditfield(app.InitialpositionPanel, 'numeric');
        app.ShoulderEditField_5.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_5.Position = [83 110 100 22];

        % Create ShoulderEditField_5Label
        app.ShoulderEditField_5Label =
uilabel(app.InitialpositionPanel);
        app.ShoulderEditField_5Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_5Label.Position = [8 110 54 22];
        app.ShoulderEditField_5Label.Text = 'Shoulder';

        % Create TransverseEditField_5
        app.TransverseEditField_5 =
uieditfield(app.InitialpositionPanel, 'numeric');
        app.TransverseEditField_5.Limits = [-0.8 0.8];
        app.TransverseEditField_5.Position = [83 76 100 22];

        % Create TransverseEditField_5Label
        app.TransverseEditField_5Label =
uilabel(app.InitialpositionPanel);
        app.TransverseEditField_5Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_5Label.Position = [8 76 65 22];
        app.TransverseEditField_5Label.Text = 'Transverse';

        % Create ElbowEditField_5
        app.ElbowEditField_5 =
uieditfield(app.InitialpositionPanel, 'numeric');
        app.ElbowEditField_5.Limits = [0 2.35];
        app.ElbowEditField_5.Position = [83 43 100 22];
        app.ElbowEditField_5.Value = 1.2;

        % Create ElbowEditField_5Label
        app.ElbowEditField_5Label =
uilabel(app.InitialpositionPanel);
        app.ElbowEditField_5Label.HorizontalAlignment = 'right';
        app.ElbowEditField_5Label.Position = [8 43 38 22];
        app.ElbowEditField_5Label.Text = 'Elbow';

        % Create GoButton_2
        app.GoButton_2 =
uibutton(app.InitialpositionPanel, 'state');
        app.GoButton_2.ValueChangedFcn = createCallbackFcn(app,
@GoButton_2ValueChanged, true);
        app.GoButton_2.Text = 'Go';
        app.GoButton_2.Position = [84 8 100 22];

        % Create TossCatchButton
        app.TossCatchButton = uibutton(app.JuggleLifeTab, 'push');

```

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```

        app.TossCatchButton.ButtonPushedFcn =
createCallbackFcn(app, @TossCatchButtonPushed, true);
        app.TossCatchButton.Position = [280 199 100 22];
        app.TossCatchButton.Text = 'Toss & Catch';

        % Create HomeButton_3
        app.HomeButton_3 = uibutton(app.JuggleLifeTab, 'push');
        app.HomeButton_3.ButtonPushedFcn = createCallbackFcn(app,
@HomeButton_3Pushed, true);
        app.HomeButton_3.Position = [509 51 100 22];
        app.HomeButton_3.Text = 'Home';

        % Create StartButton_2
        app.StartButton_2 = uibutton(app.JuggleLifeTab, 'push');
        app.StartButton_2.ButtonPushedFcn = createCallbackFcn(app,
@StartButton_2Pushed, true);
        app.StartButton_2.Position = [509 18 100 22];
        app.StartButton_2.Text = 'Start';

        % Create CatchingheightEditField_2Label
        app.CatchingheightEditField_2Label =
uilabel(app.JuggleLifeTab);
        app.CatchingheightEditField_2Label.HorizontalAlignment
= 'right';
        app.CatchingheightEditField_2Label.Position = [25 199 89
22];
        app.CatchingheightEditField_2Label.Text = 'Catching
height';

        % Create CatchingheightEditField_2
        app.CatchingheightEditField_2 =
uieditfield(app.JuggleLifeTab, 'numeric');
        app.CatchingheightEditField_2.Position = [159 199 100 22];
        app.CatchingheightEditField_2.Value = 1;

        % Create JugglecontButton
        app.JugglecontButton =
uibutton(app.JuggleLifeTab, 'push');
        app.JugglecontButton.ButtonPushedFcn =
createCallbackFcn(app, @JugglecontButtonPushed, true);
        app.JugglecontButton.Position = [281 164 100 22];
        app.JugglecontButton.Text = 'Juggle (cont)';

        % Create FinalpositionPanel
        app.FinalpositionPanel = uipanel(app.JuggleLifeTab);
        app.FinalpositionPanel.Title = 'Final position';
        app.FinalpositionPanel.Position = [249 233 204 161];

        % Create ShoulderEditField_10
        app.ShoulderEditField_10 =
uieditfield(app.FinalpositionPanel, 'numeric');
        app.ShoulderEditField_10.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_10.Position = [83 110 100 22];

```

---

---

```

        % Create ShoulderEditField_10Label
        app.ShoulderEditField_10Label =
uicontrol(app.FinalpositionPanel);
        app.ShoulderEditField_10Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_10Label.Position = [8 110 54 22];
        app.ShoulderEditField_10Label.Text = 'Shoulder';

        % Create TransverseEditField_10
        app.TransverseEditField_10 =
uicontrol(app.FinalpositionPanel, 'numeric');
        app.TransverseEditField_10.Limits = [-0.8 0.8];
        app.TransverseEditField_10.Position = [83 76 100 22];

        % Create TransverseEditField_10Label
        app.TransverseEditField_10Label =
uicontrol(app.FinalpositionPanel);
        app.TransverseEditField_10Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_10Label.Position = [8 76 65 22];
        app.TransverseEditField_10Label.Text = 'Transverse';

        % Create ElbowEditField_10
        app.ElbowEditField_10 =
uicontrol(app.FinalpositionPanel, 'numeric');
        app.ElbowEditField_10.Limits = [0 2.35];
        app.ElbowEditField_10.Position = [83 43 100 22];
        app.ElbowEditField_10.Value = 1.8;

        % Create ElbowEditField_10Label
        app.ElbowEditField_10Label =
uicontrol(app.FinalpositionPanel);
        app.ElbowEditField_10Label.HorizontalAlignment = 'right';
        app.ElbowEditField_10Label.Position = [8 43 38 22];
        app.ElbowEditField_10Label.Text = 'Elbow';

        % Create JuggleEstimationTab
        app.JuggleEstimationTab = uitab(app.TabGroup);
        app.JuggleEstimationTab.Title = 'Juggle Estimation';

        % Create JuggleEstimationLabel
        app.JuggleEstimationLabel =
uicontrol(app.JuggleEstimationTab);
        app.JuggleEstimationLabel.FontSize = 20;
        app.JuggleEstimationLabel.FontWeight = 'bold';
        app.JuggleEstimationLabel.Position = [241 410 178 24];
        app.JuggleEstimationLabel.Text = 'Juggle Estimation';

        % Create InitialpositionPanel_2
        app.InitialpositionPanel_2 =
uicontrol(app.JuggleEstimationTab);
        app.InitialpositionPanel_2.Title = 'Initial position';
        app.InitialpositionPanel_2.Position = [17 233 204 161];

```

---

---

```

        % Create ShoulderEditField_9
        app.ShoulderEditField_9 =
uieditfield(app.InitialpositionPanel_2, 'numeric');
        app.ShoulderEditField_9.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_9.Position = [83 110 100 22];

        % Create ShoulderEditField_9Label
        app.ShoulderEditField_9Label =
uilabel(app.InitialpositionPanel_2);
        app.ShoulderEditField_9Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_9Label.Position = [8 110 54 22];
        app.ShoulderEditField_9Label.Text = 'Shoulder';

        % Create TransverseEditField_9
        app.TransverseEditField_9 =
uieditfield(app.InitialpositionPanel_2, 'numeric');
        app.TransverseEditField_9.Limits = [-0.8 0.8];
        app.TransverseEditField_9.Position = [83 76 100 22];

        % Create TransverseEditField_9Label
        app.TransverseEditField_9Label =
uilabel(app.InitialpositionPanel_2);
        app.TransverseEditField_9Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_9Label.Position = [8 76 65 22];
        app.TransverseEditField_9Label.Text = 'Transverse';

        % Create ElbowEditField_9
        app.ElbowEditField_9 =
uieditfield(app.InitialpositionPanel_2, 'numeric');
        app.ElbowEditField_9.Limits = [0 2.35];
        app.ElbowEditField_9.Position = [83 43 100 22];
        app.ElbowEditField_9.Value = 1.2;

        % Create ElbowEditField_9Label
        app.ElbowEditField_9Label =
uilabel(app.InitialpositionPanel_2);
        app.ElbowEditField_9Label.HorizontalAlignment = 'right';
        app.ElbowEditField_9Label.Position = [8 43 38 22];
        app.ElbowEditField_9Label.Text = 'Elbow';

        % Create GoButton_3
        app.GoButton_3 =
uibutton(app.InitialpositionPanel_2, 'state');
        app.GoButton_3.ValueChangedFcn = createCallbackFcn(app,
@GoButton_3ValueChanged, true);
        app.GoButton_3.Text = 'Go';
        app.GoButton_3.Position = [84 8 100 22];

        % Create TossCatchButton_2
        app.TossCatchButton_2 =
uibutton(app.JuggleEstimationTab, 'push');

```

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```

        app.TossCatchButton_2.ButtonPushedFcn =
createCallbackFcn(app, @TossCatchButton_2Pushed, true);
        app.TossCatchButton_2.Position = [280 199 100 22];
        app.TossCatchButton_2.Text = 'Toss & Catch';

        % Create HomeButton_6
        app.HomeButton_6 =
uibutton(app.JuggleEstimationTab, 'push');
        app.HomeButton_6.ButtonPushedFcn = createCallbackFcn(app,
@HomeButton_6Pushed, true);
        app.HomeButton_6.Position = [509 51 100 22];
        app.HomeButton_6.Text = 'Home';

        % Create StartButton_5
        app.StartButton_5 =
uibutton(app.JuggleEstimationTab, 'push');
        app.StartButton_5.ButtonPushedFcn = createCallbackFcn(app,
@StartButton_5Pushed, true);
        app.StartButton_5.Position = [509 18 100 22];
        app.StartButton_5.Text = 'Start';

        % Create JugglecontButton_2
        app.JugglecontButton_2 =
uibutton(app.JuggleEstimationTab, 'push');
        app.JugglecontButton_2.ButtonPushedFcn =
createCallbackFcn(app, @JugglecontButton_2Pushed, true);
        app.JugglecontButton_2.Position = [281 164 100 22];
        app.JugglecontButton_2.Text = 'Juggle (cont)';

        % Create CatchingheightEditField_4Label
        app.CatchingheightEditField_4Label =
uilabel(app.JuggleEstimationTab);
        app.CatchingheightEditField_4Label.HorizontalAlignment
= 'right';
        app.CatchingheightEditField_4Label.Position = [25 199 89
22];
        app.CatchingheightEditField_4Label.Text = 'Catching
height';

        % Create CatchingheightEditField_4
        app.CatchingheightEditField_4 =
uieditfield(app.JuggleEstimationTab, 'numeric');
        app.CatchingheightEditField_4.Position = [159 199 100 22];
        app.CatchingheightEditField_4.Value = 1;

        % Create FinalpositionPanel_2
        app.FinalpositionPanel_2 =
uipanel(app.JuggleEstimationTab);
        app.FinalpositionPanel_2.Title = 'Final position';
        app.FinalpositionPanel_2.Position = [249 233 204 161];

        % Create ShoulderEditField_11
        app.ShoulderEditField_11 =
uieditfield(app.FinalpositionPanel_2, 'numeric');

```

---

---

```

        app.ShoulderEditField_11.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_11.Position = [83 110 100 22];

        % Create ShoulderEditField_11Label
        app.ShoulderEditField_11Label =
        uilabel(app.FinalpositionPanel_2);
        app.ShoulderEditField_11Label.HorizontalAlignment
        = 'right';
        app.ShoulderEditField_11Label.Position = [8 110 54 22];
        app.ShoulderEditField_11Label.Text = 'Shoulder';

        % Create TransverseEditField_11
        app.TransverseEditField_11 =
        uieditfield(app.FinalpositionPanel_2, 'numeric');
        app.TransverseEditField_11.Limits = [-0.8 0.8];
        app.TransverseEditField_11.Position = [83 76 100 22];

        % Create TransverseEditField_11Label
        app.TransverseEditField_11Label =
        uilabel(app.FinalpositionPanel_2);
        app.TransverseEditField_11Label.HorizontalAlignment
        = 'right';
        app.TransverseEditField_11Label.Position = [8 76 65 22];
        app.TransverseEditField_11Label.Text = 'Transverse';

        % Create ElbowEditField_11
        app.ElbowEditField_11 =
        uieditfield(app.FinalpositionPanel_2, 'numeric');
        app.ElbowEditField_11.Limits = [0 2.35];
        app.ElbowEditField_11.Position = [83 43 100 22];
        app.ElbowEditField_11.Value = 1.9;

        % Create ElbowEditField_11Label
        app.ElbowEditField_11Label =
        uilabel(app.FinalpositionPanel_2);
        app.ElbowEditField_11Label.HorizontalAlignment = 'right';
        app.ElbowEditField_11Label.Position = [8 43 38 22];
        app.ElbowEditField_11Label.Text = 'Elbow';

        % Create HumaninteractionTab
        app.HumaninteractionTab = uitab(app.TabGroup);
        app.HumaninteractionTab.Title = 'Human interaction';

        % Create HomeButton_4
        app.HomeButton_4 =
        uibutton(app.HumaninteractionTab, 'push');
        app.HomeButton_4.ButtonPushedFcn = createCallbackFcn(app,
        @HomeButton_4Pushed, true);
        app.HomeButton_4.Position = [509 51 100 22];
        app.HomeButton_4.Text = 'Home';

        % Create StartButton_3
        app.StartButton_3 =
        uibutton(app.HumaninteractionTab, 'push');

```

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```

        app.StartButton_3.ButtonPushedFcn = createCallbackFcn(app,
@StartButton_3Pushed, true);
        app.StartButton_3.Position = [509 18 100 22];
        app.StartButton_3.Text = 'Start';

        % Create TossingcommandsPanel
        app.TossingcommandsPanel =
uipanel(app.HumaninteractionTab);
        app.TossingcommandsPanel.Title = 'Tossing commands';
        app.TossingcommandsPanel.Position = [20 248 204 161];

        % Create ShoulderEditField_8
        app.ShoulderEditField_8 =
uieditfield(app.TossingcommandsPanel, 'numeric');
        app.ShoulderEditField_8.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_8.Position = [83 110 100 22];

        % Create ShoulderEditField_8Label
        app.ShoulderEditField_8Label =
uilabel(app.TossingcommandsPanel);
        app.ShoulderEditField_8Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_8Label.Position = [8 110 54 22];
        app.ShoulderEditField_8Label.Text = 'Shoulder';

        % Create TransverseEditField_8
        app.TransverseEditField_8 =
uieditfield(app.TossingcommandsPanel, 'numeric');
        app.TransverseEditField_8.Limits = [-0.8 0.8];
        app.TransverseEditField_8.Position = [83 76 100 22];

        % Create TransverseEditField_8Label
        app.TransverseEditField_8Label =
uilabel(app.TossingcommandsPanel);
        app.TransverseEditField_8Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_8Label.Position = [8 76 65 22];
        app.TransverseEditField_8Label.Text = 'Transverse';

        % Create ElbowEditField_8
        app.ElbowEditField_8 =
uieditfield(app.TossingcommandsPanel, 'numeric');
        app.ElbowEditField_8.Limits = [0 2.35];
        app.ElbowEditField_8.Position = [83 43 100 22];
        app.ElbowEditField_8.Value = 1.6;

        % Create ElbowEditField_8Label
        app.ElbowEditField_8Label =
uilabel(app.TossingcommandsPanel);
        app.ElbowEditField_8Label.HorizontalAlignment = 'right';
        app.ElbowEditField_8Label.Position = [8 43 38 22];
        app.ElbowEditField_8Label.Text = 'Elbow';

        % Create TossButton

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```

        app.TossButton =
uibutton(app.TossingcommandsPanel, 'state');
        app.TossButton.ValueChangedFcn = createCallbackFcn(app,
@TossButtonValueChanged, true);
        app.TossButton.Text = 'Toss';
        app.TossButton.Position = [84 8 100 22];

        % Create HomeButton_5
        app.HomeButton_5 =
uibutton(app.HumaninteractionTab, 'push');
        app.HomeButton_5.ButtonPushedFcn = createCallbackFcn(app,
@HomeButton_5Pushed, true);
        app.HomeButton_5.Position = [509 51 100 22];
        app.HomeButton_5.Text = 'Home';

        % Create StartButton_4
        app.StartButton_4 =
uibutton(app.HumaninteractionTab, 'push');
        app.StartButton_4.ButtonPushedFcn = createCallbackFcn(app,
@StartButton_4Pushed, true);
        app.StartButton_4.Position = [509 18 100 22];
        app.StartButton_4.Text = 'Start';

        % Create InteractButton
        app.InteractButton =
uibutton(app.HumaninteractionTab, 'push');
        app.InteractButton.Position = [444 121 100 22];
        app.InteractButton.Text = 'Interact';

        % Create LivecatchingcommandsPanel
        app.LivecatchingcommandsPanel =
uipanel(app.HumaninteractionTab);
        app.LivecatchingcommandsPanel.Title = 'Live catching
commands';
        app.LivecatchingcommandsPanel.Position = [292 167 300
253];

        % Create LimitxminEditField
        app.LimitxminEditField =
uieditfield(app.LivecatchingcommandsPanel, 'numeric');
        app.LimitxminEditField.Limits = [-1.5708 1.5708];
        app.LimitxminEditField.Position = [91 202 45 22];
        app.LimitxminEditField.Value = 0.08;

        % Create LimitxminEditFieldLabel
        app.LimitxminEditFieldLabel =
uilabel(app.LivecatchingcommandsPanel);
        app.LimitxminEditFieldLabel.HorizontalAlignment = 'right';
        app.LimitxminEditFieldLabel.Position = [9 202 71 22];
        app.LimitxminEditFieldLabel.Text = 'Limit x (min)';

        % Create LimityminEditField
        app.LimityminEditField =
uieditfield(app.LivecatchingcommandsPanel, 'numeric');

```

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```

app.LimityminEditField.Limits = [-0.8 0.8];
app.LimityminEditField.Position = [92 168 45 22];

% Create LimityminEditFieldLabel
app.LimityminEditFieldLabel =
uicontrol(app.LivecatchingcommandsPanel);
app.LimityminEditFieldLabel.HorizontalAlignment = 'right';
app.LimityminEditFieldLabel.Position = [10 168 71 22];
app.LimityminEditFieldLabel.Text = 'Limit y (min)';

% Create CatchingheightEditField_3
app.CatchingheightEditField_3 =
uicontrol(app.LivecatchingcommandsPanel, 'numeric');
app.CatchingheightEditField_3.Limits = [0 2.35];
app.CatchingheightEditField_3.Position = [130 44 113 22];
app.CatchingheightEditField_3.Value = 1;

% Create CatchingheightEditField_3Label
app.CatchingheightEditField_3Label =
uicontrol(app.LivecatchingcommandsPanel);
app.CatchingheightEditField_3Label.HorizontalAlignment
= 'right';
app.CatchingheightEditField_3Label.Position = [19 44 89
22];
app.CatchingheightEditField_3Label.Text = 'Catching
height';

% Create CatchButton_2
app.CatchButton_2 =
uibutton(app.LivecatchingcommandsPanel, 'state');
app.CatchButton_2.ValueChangedFcn = createCallbackFcn(app,
@CatchButton_2ValueChanged, true);
app.CatchButton_2.Text = 'Catch';
app.CatchButton_2.Position = [101 9 100 22];

% Create LimitxmaxEditField
app.LimitxmaxEditField =
uicontrol(app.LivecatchingcommandsPanel, 'numeric');
app.LimitxmaxEditField.Limits = [-1.5708 1.5708];
app.LimitxmaxEditField.Position = [242 202 45 22];
app.LimitxmaxEditField.Value = 0.57;

% Create LimitxmaxEditFieldLabel
app.LimitxmaxEditFieldLabel =
uicontrol(app.LivecatchingcommandsPanel);
app.LimitxmaxEditFieldLabel.HorizontalAlignment = 'right';
app.LimitxmaxEditFieldLabel.Position = [157 202 74 22];
app.LimitxmaxEditFieldLabel.Text = 'Limit x (max)';

% Create LimitymaxEditField
app.LimitymaxEditField =
uicontrol(app.LivecatchingcommandsPanel, 'numeric');
app.LimitymaxEditField.Limits = [-0.8 0.8];
app.LimitymaxEditField.Position = [242 168 45 22];

```

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```

app.LimitymaxEditField.Value = 0.485;

% Create LimitymaxEditFieldLabel
app.LimitymaxEditFieldLabel =
uilabel(app.LivecatchingcommandsPanel);
app.LimitymaxEditFieldLabel.HorizontalAlignment = 'right';
app.LimitymaxEditFieldLabel.Position = [157 168 74 22];
app.LimitymaxEditFieldLabel.Text = 'Limit y (max)';

% Create CatchingtimeEditField
app.CatchingtimeEditField =
uieditfield(app.LivecatchingcommandsPanel, 'numeric');
app.CatchingtimeEditField.Limits = [0 60];
app.CatchingtimeEditField.Position = [130 79 113 22];
app.CatchingtimeEditField.Value = 2;

% Create CatchingtimeEditFieldLabel
app.CatchingtimeEditFieldLabel =
uilabel(app.LivecatchingcommandsPanel);
app.CatchingtimeEditFieldLabel.HorizontalAlignment
= 'right';
app.CatchingtimeEditFieldLabel.Position = [18 79 79 22];
app.CatchingtimeEditFieldLabel.Text = 'Catching time';

% Create LimitzEditField
app.LimitzEditField =
uieditfield(app.LivecatchingcommandsPanel, 'numeric');
app.LimitzEditField.Limits = [1 2.5];
app.LimitzEditField.Position = [92 135 45 22];
app.LimitzEditField.Value = 1.9;

% Create LimitzEditFieldLabel
app.LimitzEditFieldLabel =
uilabel(app.LivecatchingcommandsPanel);
app.LimitzEditFieldLabel.HorizontalAlignment = 'right';
app.LimitzEditFieldLabel.Position = [10 135 40 22];
app.LimitzEditFieldLabel.Text = 'Limit z';

% Create HumaninteractionLabel
app.HumaninteractionLabel =
uilabel(app.HumaninteractionTab);
app.HumaninteractionLabel.FontSize = 20;
app.HumaninteractionLabel.FontWeight = 'bold';
app.HumaninteractionLabel.Position = [225 419 181 24];
app.HumaninteractionLabel.Text = 'Human interaction';

% Create EstimationcatchingcommandsPanel
app.EstimationcatchingcommandsPanel =
uipanel(app.HumaninteractionTab);
app.EstimationcatchingcommandsPanel.Title = 'Estimation
catching commands';
app.EstimationcatchingcommandsPanel.Position = [20 61 208
161];

```

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```

        % Create SamplingthEditField
        app.SamplingthEditField =
uieditfield(app.EstimationcatchingcommandsPanel, 'numeric');
        app.SamplingthEditField.Limits = [-1.5708 1.5708];
        app.SamplingthEditField.Position = [95 110 100 22];
        app.SamplingthEditField.Value = 1.24;

        % Create SamplingthEditFieldLabel
        app.SamplingthEditFieldLabel =
uilabel(app.EstimationcatchingcommandsPanel);
        app.SamplingthEditFieldLabel.HorizontalAlignment
= 'right';
        app.SamplingthEditFieldLabel.Position = [4 110 69 22];
        app.SamplingthEditFieldLabel.Text = 'Sampling th';

        % Create CatchheightEditField
        app.CatchheightEditField =
uieditfield(app.EstimationcatchingcommandsPanel, 'numeric');
        app.CatchheightEditField.Limits = [-0.5 1.5];
        app.CatchheightEditField.Position = [95 76 100 22];
        app.CatchheightEditField.Value = 1;

        % Create CatchheightEditFieldLabel
        app.CatchheightEditFieldLabel =
uilabel(app.EstimationcatchingcommandsPanel);
        app.CatchheightEditFieldLabel.HorizontalAlignment
= 'right';
        app.CatchheightEditFieldLabel.Position = [4 76 73 22];
        app.CatchheightEditFieldLabel.Text = 'Catch height';

        % Create CatchButton_3
        app.CatchButton_3 =
uibutton(app.EstimationcatchingcommandsPanel, 'state');
        app.CatchButton_3.ValueChangedFcn = createCallbackFcn(app,
@CatchButton_3ValueChanged, true);
        app.CatchButton_3.Text = 'Catch';
        app.CatchButton_3.Position = [61 39 100 22];

        % Create HardcodedJuggleTab
        app.HardcodedJuggleTab = uitab(app.TabGroup);
        app.HardcodedJuggleTab.Title = 'Hard coded Juggle';

        % Create StartPanel
        app.StartPanel = uipanel(app.HardcodedJuggleTab);
        app.StartPanel.Title = 'Start';
        app.StartPanel.Position = [1 282 204 161];

        % Create ShoulderEditField_2
        app.ShoulderEditField_2 =
uieditfield(app.StartPanel, 'numeric');
        app.ShoulderEditField_2.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_2.Position = [83 110 100 22];

        % Create ShoulderEditField_2Label

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```

        app.ShoulderEditField_2Label = uilabel(app.StartPanel);
        app.ShoulderEditField_2Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_2Label.Position = [8 110 54 22];
        app.ShoulderEditField_2Label.Text = 'Shoulder';

        % Create TransverseEditField_2
        app.TransverseEditField_2 =
uieditfield(app.StartPanel, 'numeric');
        app.TransverseEditField_2.Limits = [-0.8 0.8];
        app.TransverseEditField_2.Position = [83 76 100 22];

        % Create TransverseEditField_2Label
        app.TransverseEditField_2Label = uilabel(app.StartPanel);
        app.TransverseEditField_2Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_2Label.Position = [8 76 65 22];
        app.TransverseEditField_2Label.Text = 'Transverse';

        % Create ElbowEditField_2
        app.ElbowEditField_2 =
uieditfield(app.StartPanel, 'numeric');
        app.ElbowEditField_2.Limits = [0 4.7124];
        app.ElbowEditField_2.Position = [83 43 100 22];
        app.ElbowEditField_2.Value = 0.5;

        % Create ElbowEditField_2Label
        app.ElbowEditField_2Label = uilabel(app.StartPanel);
        app.ElbowEditField_2Label.HorizontalAlignment = 'right';
        app.ElbowEditField_2Label.Position = [8 43 38 22];
        app.ElbowEditField_2Label.Text = 'Elbow';

        % Create TossPanel
        app.TossPanel = uipanel(app.HardcodedJuggleTab);
        app.TossPanel.Title = 'Toss';
        app.TossPanel.Position = [1 72 204 161];

        % Create ShoulderEditField_3
        app.ShoulderEditField_3 =
uieditfield(app.TossPanel, 'numeric');
        app.ShoulderEditField_3.Limits = [-1.5708 1.5708];
        app.ShoulderEditField_3.Position = [83 110 100 22];
        app.ShoulderEditField_3.Value = 0.2;

        % Create ShoulderEditField_3Label
        app.ShoulderEditField_3Label = uilabel(app.TossPanel);
        app.ShoulderEditField_3Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_3Label.Position = [8 110 54 22];
        app.ShoulderEditField_3Label.Text = 'Shoulder';

        % Create TransverseEditField_3
        app.TransverseEditField_3 =
uieditfield(app.TossPanel, 'numeric');

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```

app.TransverseEditField_3.Limits = [-0.8 0.8];
app.TransverseEditField_3.Position = [83 76 100 22];

% Create TransverseEditField_3Label
app.TransverseEditField_3Label = uilabel(app.TossPanel);
app.TransverseEditField_3Label.HorizontalAlignment
= 'right';
app.TransverseEditField_3Label.Position = [8 76 65 22];
app.TransverseEditField_3Label.Text = 'Transverse';

% Create ElbowEditField_3
app.ElbowEditField_3 =
uieditfield(app.TossPanel, 'numeric');
app.ElbowEditField_3.Limits = [0 4.7124];
app.ElbowEditField_3.Position = [83 43 100 22];
app.ElbowEditField_3.Value = 2;

% Create ElbowEditField_3Label
app.ElbowEditField_3Label = uilabel(app.TossPanel);
app.ElbowEditField_3Label.HorizontalAlignment = 'right';
app.ElbowEditField_3Label.Position = [8 43 38 22];
app.ElbowEditField_3Label.Text = 'Elbow';

% Create CatchPanel
app.CatchPanel = uipanel(app.HardcodedJuggleTab);
app.CatchPanel.Title = 'Catch';
app.CatchPanel.Position = [204 72 204 161];

% Create ShoulderEditField_4
app.ShoulderEditField_4 =
uieditfield(app.CatchPanel, 'numeric');
app.ShoulderEditField_4.Limits = [-1.5708 1.5708];
app.ShoulderEditField_4.Position = [83 110 100 22];
app.ShoulderEditField_4.Value = 0.2;

% Create ShoulderEditField_4Label
app.ShoulderEditField_4Label = uilabel(app.CatchPanel);
app.ShoulderEditField_4Label.HorizontalAlignment
= 'right';
app.ShoulderEditField_4Label.Position = [8 110 54 22];
app.ShoulderEditField_4Label.Text = 'Shoulder';

% Create TransverseEditField_4
app.TransverseEditField_4 =
uieditfield(app.CatchPanel, 'numeric');
app.TransverseEditField_4.Limits = [-0.8 0.8];
app.TransverseEditField_4.Position = [83 76 100 22];
app.TransverseEditField_4.Value = -0.1;

% Create TransverseEditField_4Label
app.TransverseEditField_4Label = uilabel(app.CatchPanel);
app.TransverseEditField_4Label.HorizontalAlignment
= 'right';
app.TransverseEditField_4Label.Position = [8 76 65 22];

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        app.TransverseEditField_4Label.Text = 'Transverse';

        % Create ElbowEditField_4
        app.ElbowEditField_4 =
uieditfield(app.CatchPanel, 'numeric');
        app.ElbowEditField_4.Limits = [0 4.7124];
        app.ElbowEditField_4.Position = [83 43 100 22];
        app.ElbowEditField_4.Value = 2;

        % Create ElbowEditField_4Label
        app.ElbowEditField_4Label = uilabel(app.CatchPanel);
        app.ElbowEditField_4Label.HorizontalAlignment = 'right';
        app.ElbowEditField_4Label.Position = [8 43 38 22];
        app.ElbowEditField_4Label.Text = 'Elbow';

        % Create JuggleButton
        app.JuggleButton =
uibutton(app.HardcodedJuggleTab, 'push');
        app.JuggleButton.ButtonPushedFcn = createCallbackFcn(app,
@JuggleButtonPushed, true);
        app.JuggleButton.Position = [429 72 100 22];
        app.JuggleButton.Text = 'Juggle';

        % Create GotostartButton
        app.GotostartButton =
uibutton(app.HardcodedJuggleTab, 'push');
        app.GotostartButton.ButtonPushedFcn =
createCallbackFcn(app, @GotostartButtonPushed, true);
        app.GotostartButton.Position = [229 282 100 22];
        app.GotostartButton.Text = 'Go to start';

        % Create IKTab
        app.IKTab = uitab(app.TabGroup);
        app.IKTab.Title = 'IK';

        % Create TestIKPanel
        app.TestIKPanel = uipanel(app.IKTab);
        app.TestIKPanel.Title = 'Test IK';
        app.TestIKPanel.Position = [-1 226 196 217];

        % Create ShoulderEditField_6Label
        app.ShoulderEditField_6Label = uilabel(app.TestIKPanel);
        app.ShoulderEditField_6Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_6Label.Position = [-2 171 54 22];
        app.ShoulderEditField_6Label.Text = 'Shoulder';

        % Create ShoulderEditField_6
        app.ShoulderEditField_6 =
uieditfield(app.TestIKPanel, 'numeric');
        app.ShoulderEditField_6.ValueChangedFcn =
createCallbackFcn(app, @ShoulderEditField_6ValueChanged, true);
        app.ShoulderEditField_6.Editable = 'off';
        app.ShoulderEditField_6.Position = [78 171 100 22];

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        % Create TransverseEditField_6Label
        app.TransverseEditField_6Label = uilabel(app.TestIKPanel);
        app.TransverseEditField_6Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_6Label.Position = [-2 139 65 22];
        app.TransverseEditField_6Label.Text = 'Transverse';

        % Create TransverseEditField_6
        app.TransverseEditField_6 =
uieditfield(app.TestIKPanel, 'numeric');
        app.TransverseEditField_6.Editable = 'off';
        app.TransverseEditField_6.Position = [78 139 100 22];

        % Create ElbowEditField_6Label
        app.ElbowEditField_6Label = uilabel(app.TestIKPanel);
        app.ElbowEditField_6Label.HorizontalAlignment = 'right';
        app.ElbowEditField_6Label.Position = [-2 106 38 22];
        app.ElbowEditField_6Label.Text = 'Elbow';

        % Create ElbowEditField_6
        app.ElbowEditField_6 =
uieditfield(app.TestIKPanel, 'numeric');
        app.ElbowEditField_6.Editable = 'off';
        app.ElbowEditField_6.Position = [78 106 100 22];

        % Create CalculateButton
        app.CalculateButton = uibutton(app.TestIKPanel, 'push');
        app.CalculateButton.ButtonPushedFcn =
createCallbackFcn(app, @CalculateButtonPushed, true);
        app.CalculateButton.Position = [78 76 100 22];
        app.CalculateButton.Text = 'Calculate';

        % Create PublishButton_3
        app.PublishButton_3 = uibutton(app.TestIKPanel, 'push');
        app.PublishButton_3.ButtonPushedFcn =
createCallbackFcn(app, @PublishButton_3Pushed, true);
        app.PublishButton_3.Position = [78 42 100 22];
        app.PublishButton_3.Text = 'Publish';

        % Create CalculatePublishButton
        app.CalculatePublishButton =
uibutton(app.TestIKPanel, 'push');
        app.CalculatePublishButton.ButtonPushedFcn =
createCallbackFcn(app, @CalculatePublishButtonPushed, true);
        app.CalculatePublishButton.Position = [68 10 120 22];
        app.CalculatePublishButton.Text = 'Calculate & Publish';

        % Create StatusPanel
        app.StatusPanel = uipanel(app.IKTab);
        app.StatusPanel.Title = 'Status';
        app.StatusPanel.Position = [508 323 121 120];

        % Create AllclearLampLabel

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app.AllclearLampLabel = uilabel(app.StatusPanel);
app.AllclearLampLabel.HorizontalAlignment = 'right';
app.AllclearLampLabel.Position = [7 9 48 22];
app.AllclearLampLabel.Text = 'All clear';

% Create AllclearLamp
app.AllclearLamp = uilamp(app.StatusPanel);
app.AllclearLamp.Position = [93 10 20 20];

% Create CatchzoneLampLabel
app.CatchzoneLampLabel = uilabel(app.StatusPanel);
app.CatchzoneLampLabel.HorizontalAlignment = 'right';
app.CatchzoneLampLabel.Position = [3 71 66 22];
app.CatchzoneLampLabel.Text = 'Catch zone';

% Create CatchzoneLamp
app.CatchzoneLamp = uilamp(app.StatusPanel);
app.CatchzoneLamp.Position = [93 72 20 20];

% Create JointstatesLampLabel
app.JointstatesLampLabel = uilabel(app.StatusPanel);
app.JointstatesLampLabel.HorizontalAlignment = 'right';
app.JointstatesLampLabel.Position = [3 42 66 22];
app.JointstatesLampLabel.Text = 'Joint states';

% Create JointstatesLamp
app.JointstatesLamp = uilamp(app.StatusPanel);
app.JointstatesLamp.Position = [93 41 20 20];

% Create CatchPanel_2
app.CatchPanel_2 = uipanel(app.IKTab);
app.CatchPanel_2.Title = 'Catch';
app.CatchPanel_2.Position = [194 226 260 217];

% Create TossingheightEditFieldLabel
app.TossingheightEditFieldLabel =
uilabel(app.CatchPanel_2);
app.TossingheightEditFieldLabel.HorizontalAlignment
= 'right';
app.TossingheightEditFieldLabel.Position = [8 171 82 22];
app.TossingheightEditFieldLabel.Text = 'Tossing height';

% Create TossingheightEditField
app.TossingheightEditField =
uieditfield(app.CatchPanel_2, 'numeric');
app.TossingheightEditField.Position = [138 171 100 22];
app.TossingheightEditField.Value = 1.24;

% Create CatchingheightEditFieldLabel
app.CatchingheightEditFieldLabel =
uilabel(app.CatchPanel_2);
app.CatchingheightEditFieldLabel.HorizontalAlignment
= 'right';
app.CatchingheightEditFieldLabel.Position = [4 139 89 22];

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        app.CatchingheightEditFieldLabel.Text = 'Catching height';

        % Create CatchingheightEditField
        app.CatchingheightEditField =
uieditfield(app.CatchPanel_2, 'numeric');
        app.CatchingheightEditField.Position = [138 139 100 22];
        app.CatchingheightEditField.Value = 1;

        % Create CatchButton
        app.CatchButton = uibutton(app.CatchPanel_2, 'push');
        app.CatchButton.ButtonPushedFcn = createCallbackFcn(app,
@CatchButtonPushed, true);
        app.CatchButton.Position = [71 97 100 22];
        app.CatchButton.Text = 'Catch';

        % Create HomeButton_2
        app.HomeButton_2 = uibutton(app.IKTab, 'push');
        app.HomeButton_2.ButtonPushedFcn = createCallbackFcn(app,
@HomeButton_2Pushed, true);
        app.HomeButton_2.Position = [516 281 100 22];
        app.HomeButton_2.Text = 'Home';

        % Create GotopointPanel
        app.GotopointPanel = uipanel(app.IKTab);
        app.GotopointPanel.Title = 'Go to point';
        app.GotopointPanel.Position = [-1 75 454 152];

        % Create xEditFieldLabel
        app.xEditFieldLabel = uilabel(app.GotopointPanel);
        app.xEditFieldLabel.HorizontalAlignment = 'right';
        app.xEditFieldLabel.Position = [30 106 25 22];
        app.xEditFieldLabel.Text = 'x';

        % Create xEditField
        app.xEditField =
uieditfield(app.GotopointPanel, 'numeric');
        app.xEditField.Position = [78 106 100 22];

        % Create yEditFieldLabel
        app.yEditFieldLabel = uilabel(app.GotopointPanel);
        app.yEditFieldLabel.HorizontalAlignment = 'right';
        app.yEditFieldLabel.Position = [28 74 25 22];
        app.yEditFieldLabel.Text = 'y';

        % Create yEditField
        app.yEditField =
uieditfield(app.GotopointPanel, 'numeric');
        app.yEditField.Position = [78 74 100 22];

        % Create zEditFieldLabel
        app.zEditFieldLabel = uilabel(app.GotopointPanel);
        app.zEditFieldLabel.HorizontalAlignment = 'right';
        app.zEditFieldLabel.Position = [28 41 25 22];
        app.zEditFieldLabel.Text = 'z';

```

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```

        % Create zEditField
        app.zEditField =
uieditfield(app.GotopointPanel, 'numeric');
        app.zEditField.Position = [78 41 100 22];
        app.zEditField.Value = 1;

        % Create GoButton
        app.GoButton = uibutton(app.GotopointPanel, 'push');
        app.GoButton.ButtonPushedFcn = createCallbackFcn(app,
@GoButtonPushed, true);
        app.GoButton.Position = [78 11 100 22];
        app.GoButton.Text = 'Go';

        % Create ShoulderEditField_7Label
        app.ShoulderEditField_7Label =
uilabel(app.GotopointPanel);
        app.ShoulderEditField_7Label.HorizontalAlignment
= 'right';
        app.ShoulderEditField_7Label.Position = [227 95 54 22];
        app.ShoulderEditField_7Label.Text = 'Shoulder';

        % Create ShoulderEditField_7
        app.ShoulderEditField_7 =
uieditfield(app.GotopointPanel, 'numeric');
        app.ShoulderEditField_7.Editable = 'off';
        app.ShoulderEditField_7.Position = [307 95 100 22];

        % Create TransverseEditField_7Label
        app.TransverseEditField_7Label =
uilabel(app.GotopointPanel);
        app.TransverseEditField_7Label.HorizontalAlignment
= 'right';
        app.TransverseEditField_7Label.Position = [227 63 65 22];
        app.TransverseEditField_7Label.Text = 'Transverse';

        % Create TransverseEditField_7
        app.TransverseEditField_7 =
uieditfield(app.GotopointPanel, 'numeric');
        app.TransverseEditField_7.Editable = 'off';
        app.TransverseEditField_7.Position = [307 63 100 22];

        % Create ElbowEditField_7Label
        app.ElbowEditField_7Label = uilabel(app.GotopointPanel);
        app.ElbowEditField_7Label.HorizontalAlignment = 'right';
        app.ElbowEditField_7Label.Position = [227 30 38 22];
        app.ElbowEditField_7Label.Text = 'Elbow';

        % Create ElbowEditField_7
        app.ElbowEditField_7 =
uieditfield(app.GotopointPanel, 'numeric');
        app.ElbowEditField_7.Editable = 'off';
        app.ElbowEditField_7.Position = [307 30 100 22];

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```
% Create FollowBallButton
app.FollowBallButton = uibutton(app.IKTab, 'push');
app.FollowBallButton.ButtonPushedFcn =
createCallbackFcn(app, @FollowBallButtonPushed, true);
app.FollowBallButton.Position = [27 32 100 22];
app.FollowBallButton.Text = 'FollowBall';

% Show the figure after all components are created
app.UIFigure.Visible = 'on';
end
end

% App creation and deletion
methods (Access = public)

% Construct app
function app = jurp_app_V2_exported

% Create UIFigure and components
createComponents(app)

% Register the app with App Designer
registerApp(app, app.UIFigure)

% Execute the startup function
runStartupFcn(app, @startupFcn)

if nargin == 0
    clear app
end
end

% Code that executes before app deletion
function delete(app)

% Delete UIFigure when app is deleted
delete(app.UIFigure)
end
end
end
```

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