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function [hx, Hx] = dualBearingMeasurement(x, s1, s2)
%DUOBEARINGMEASUREMENT calculates the bearings from two sensors,
% located in
%s1 and s2, to the position given by the state vector x. Also returns
% the
% Jacobian of the model at x.
%
% Input:
%   x           [n x 1] State vector, the two first element are 2D
%               position
%   s1           [2 x 1] Sensor position (2D) for sensor 1
%   s2           [2 x 1] Sensor position (2D) for sensor 2
%
% Output:
%   hx           [2 x 1] measurement vector
%   Hx           [2 x n] measurement model Jacobian
%
% NOTE: the measurement model assumes that in the state vector x, the
% first
% two states are X-position and Y-position.

% Your code here
Hx = zeros(2,size(x,1));
hx = [atan2(x(2)-s1(2), x(1)-s1(1)) ; atan2(x(2)-s2(2), x(1)-
s2(1))];
dens1 = (x(1)-s1(1))^2 + (x(2)-s1(2))^2; dens2 = (x(1)-s2(1))^2 +
(x(2)-s2(2))^2;
Hx(1:2,1:2) = [ (-x(2)+s1(2))/dens1, (x(1)-s1(1))/dens1; (-
x(2)+s2(2))/dens2, (x(1)-s2(1))/dens2];

end

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*Published with MATLAB® R2020a*