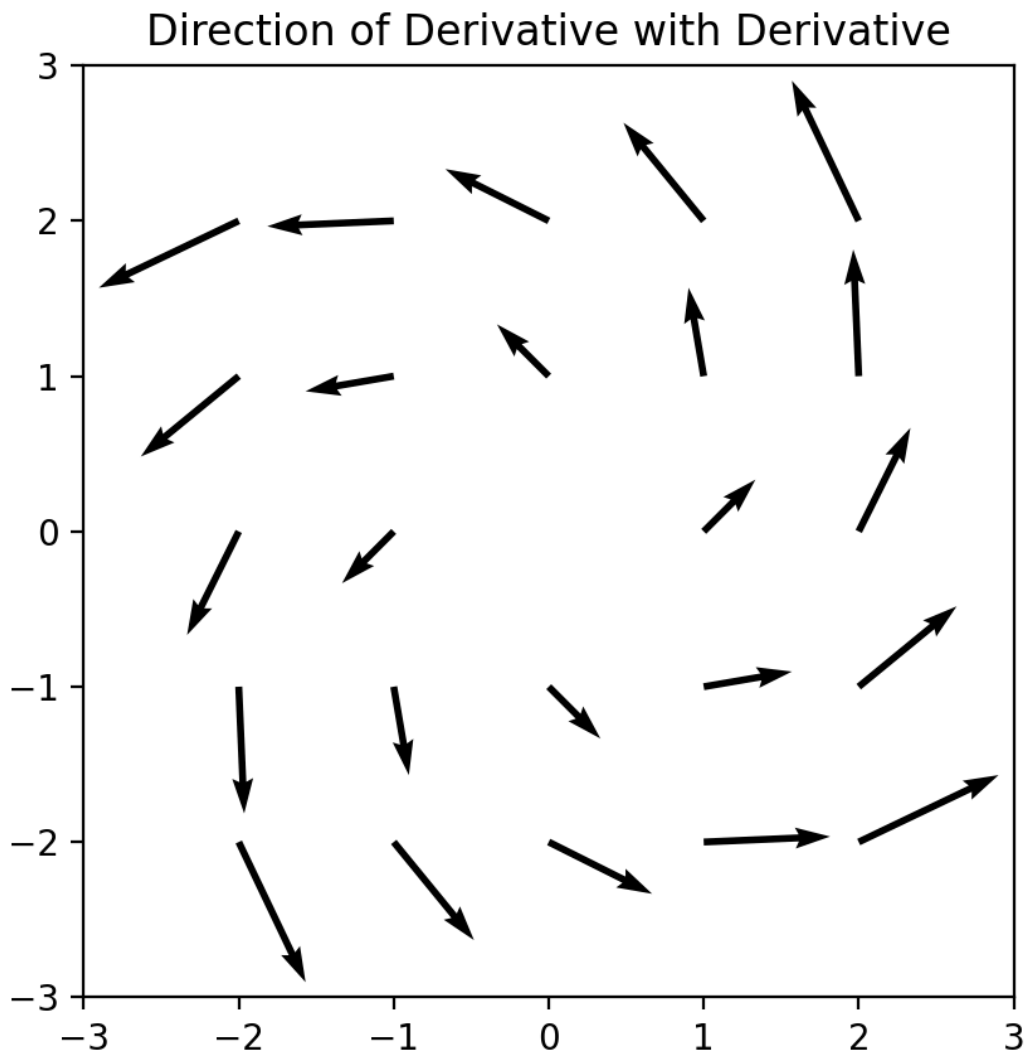


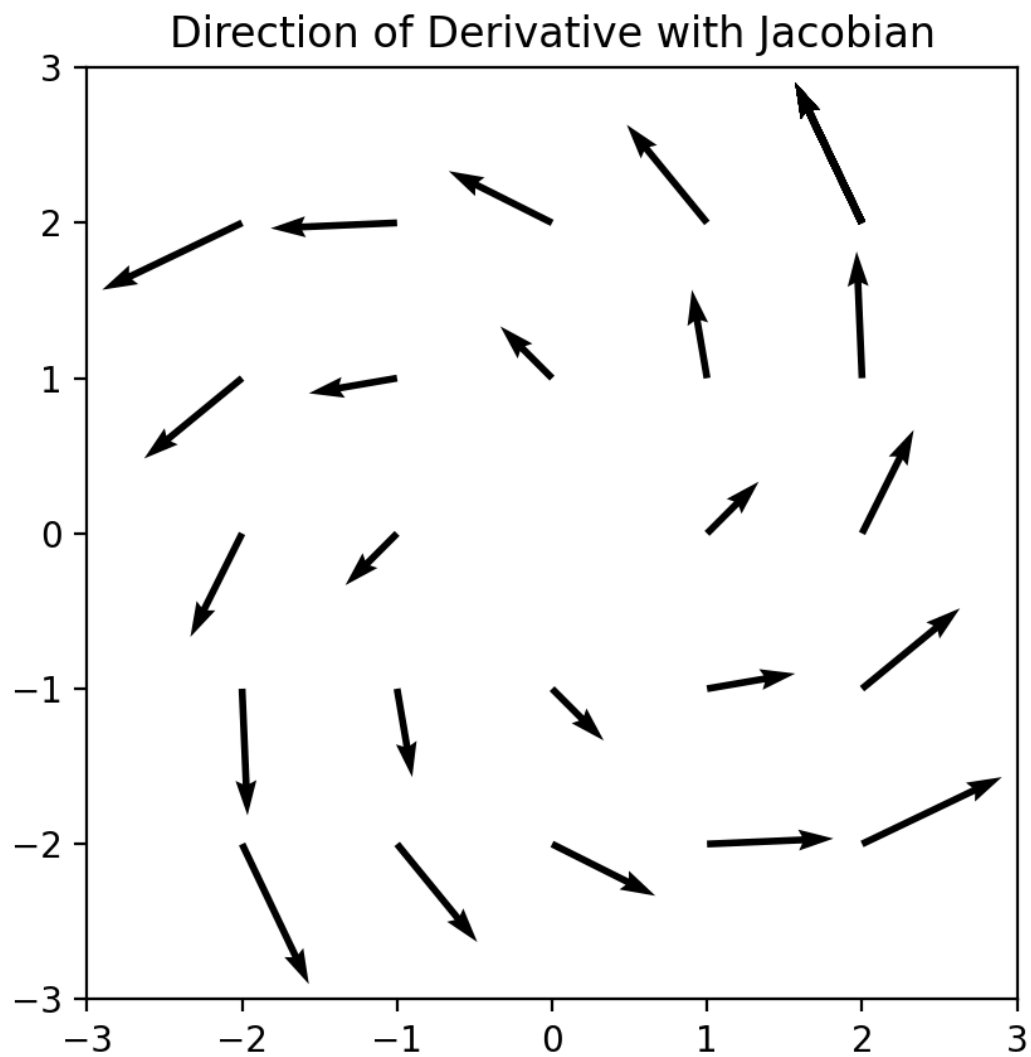
ROB541 Assignment 2
Chelse VanAtter

Part 2 Deliverable 1:



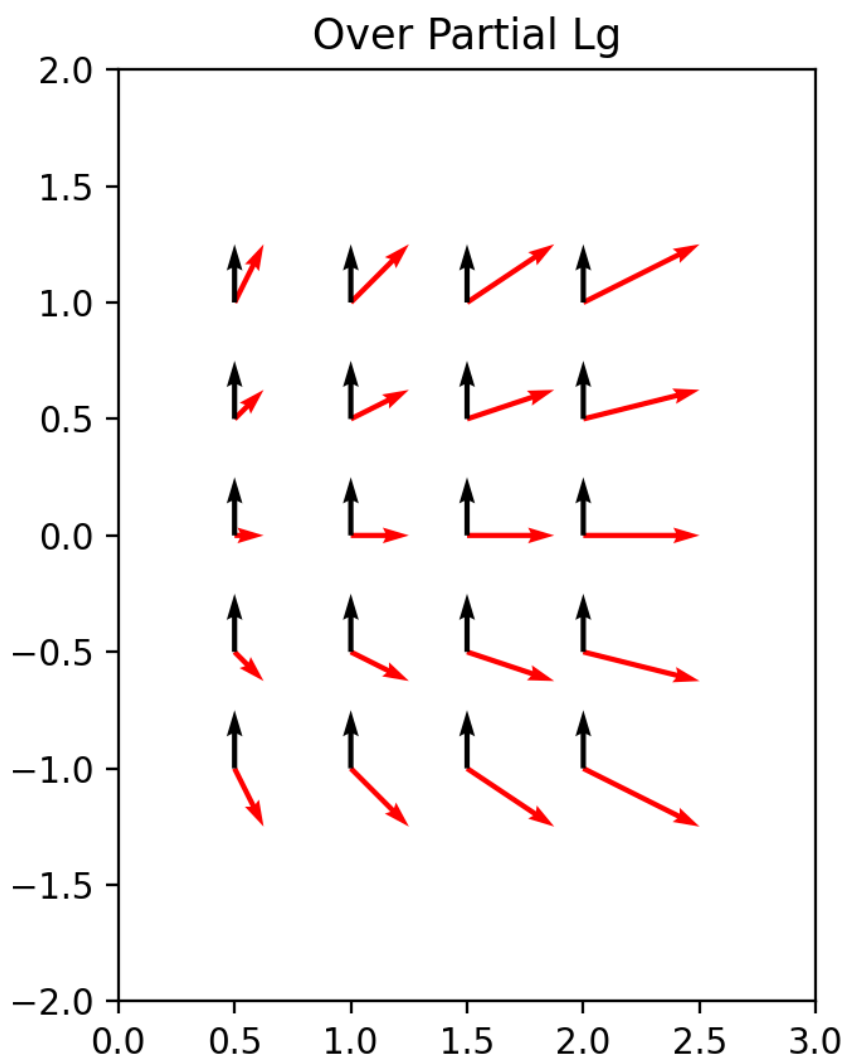
Caption: Illustration of Cartesian-Expressed Polar Vector Fields Using Direction of Derivative with Delta/Derivative Method

Part 2 Deliverable 2:



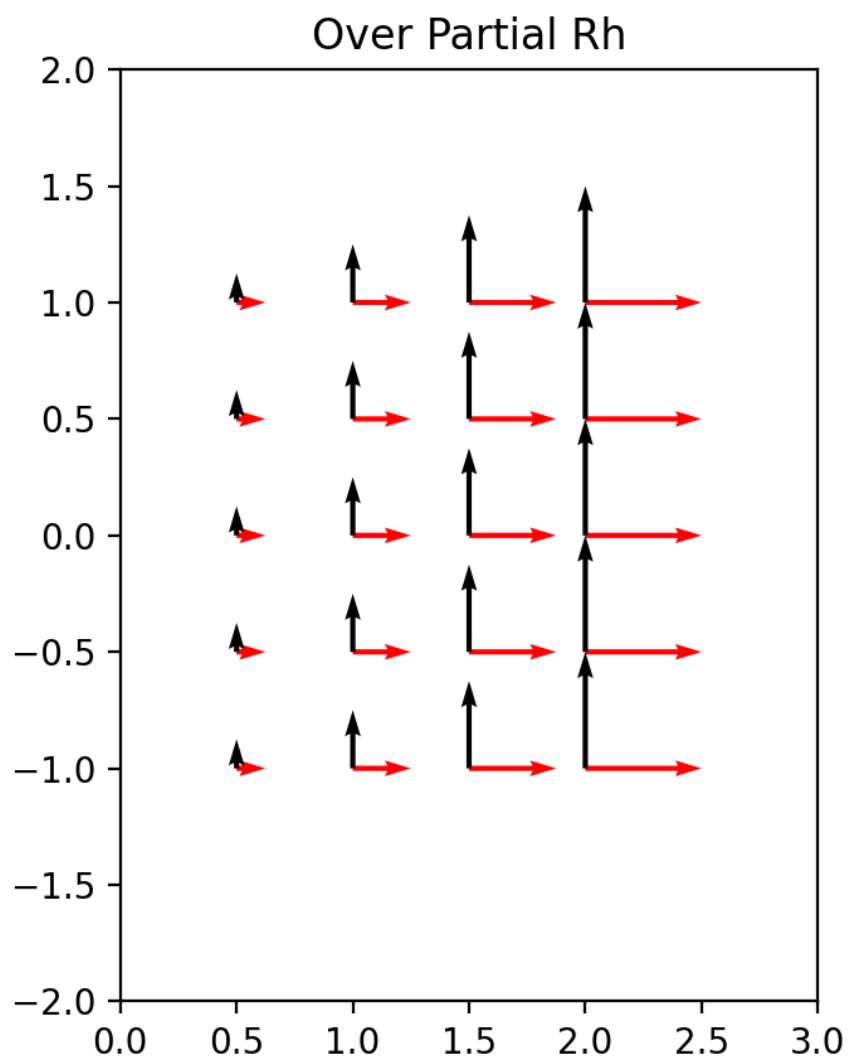
Caption: Illustration of Cartesian-Expressed Polar Vector Fields Using Direction of Derivative with Jacobian Method

Part 3 Deliverable:



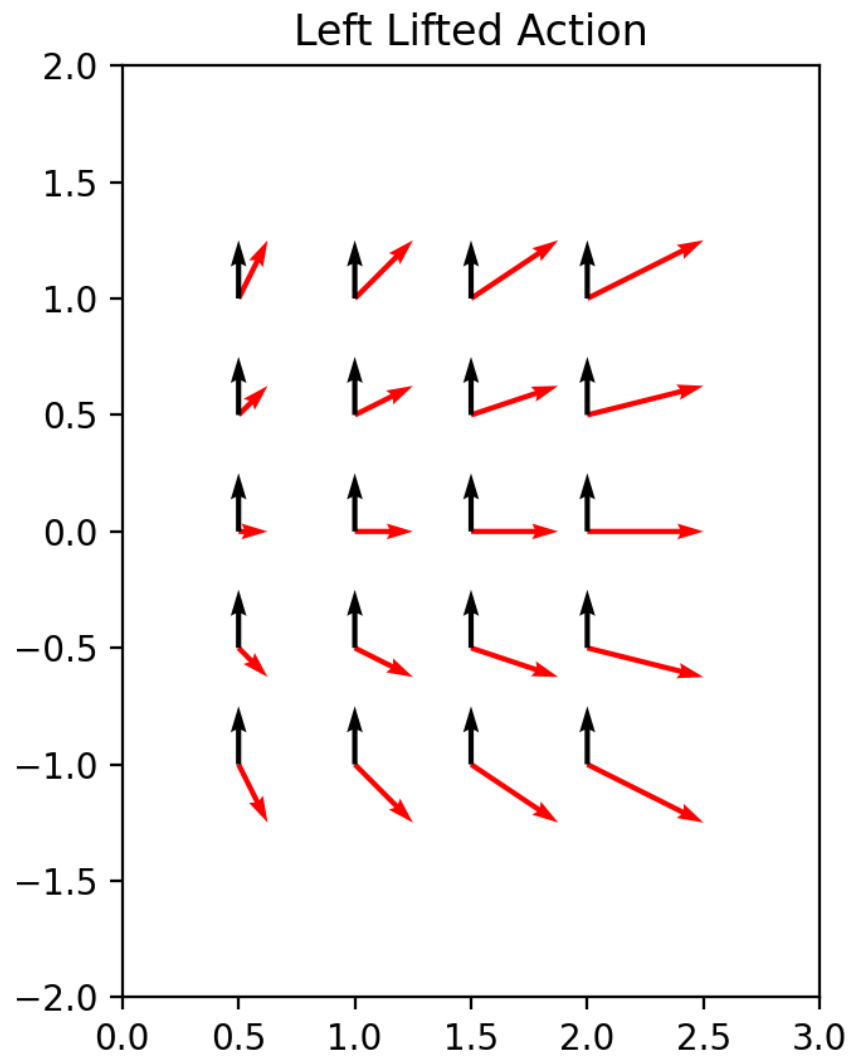
Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Direction-Derivative Function with Left-Action

Part 3 Deliverable:



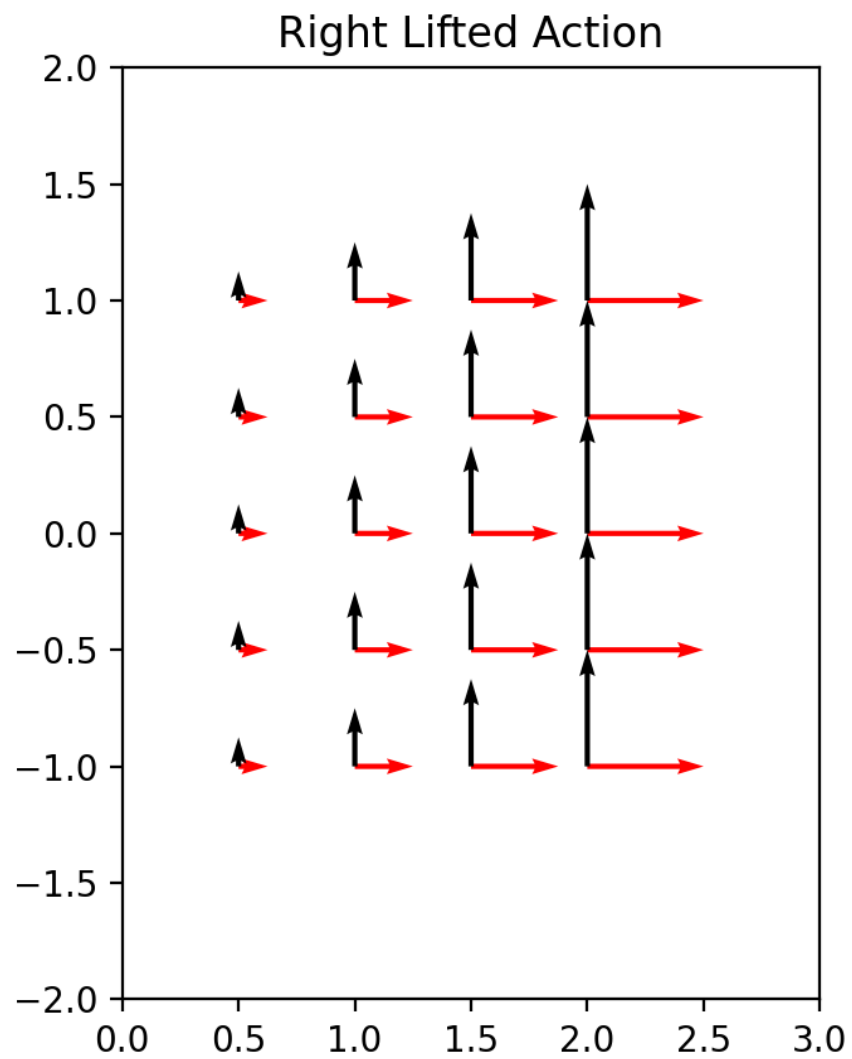
Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Direction-Derivative Function with Right-Action

Part 4 Deliverable 1:



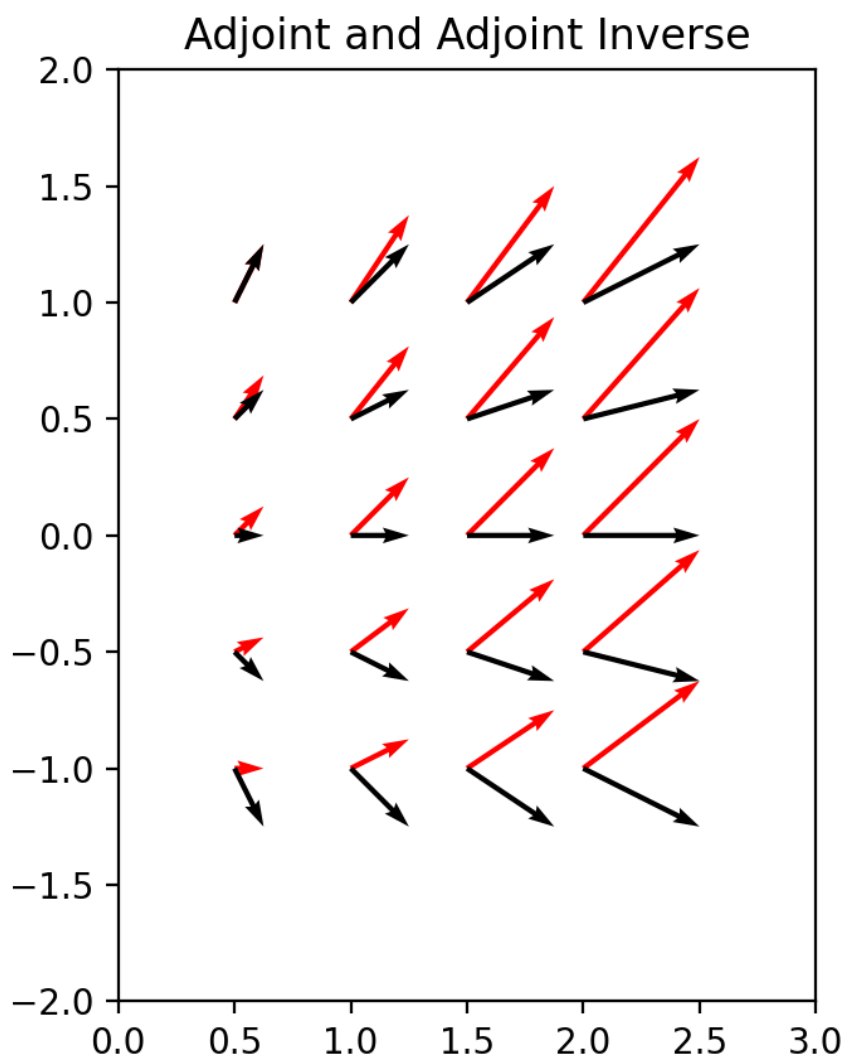
Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Lifted Action Functions with Left-Lifted Action

Part 4 Deliverable 1:



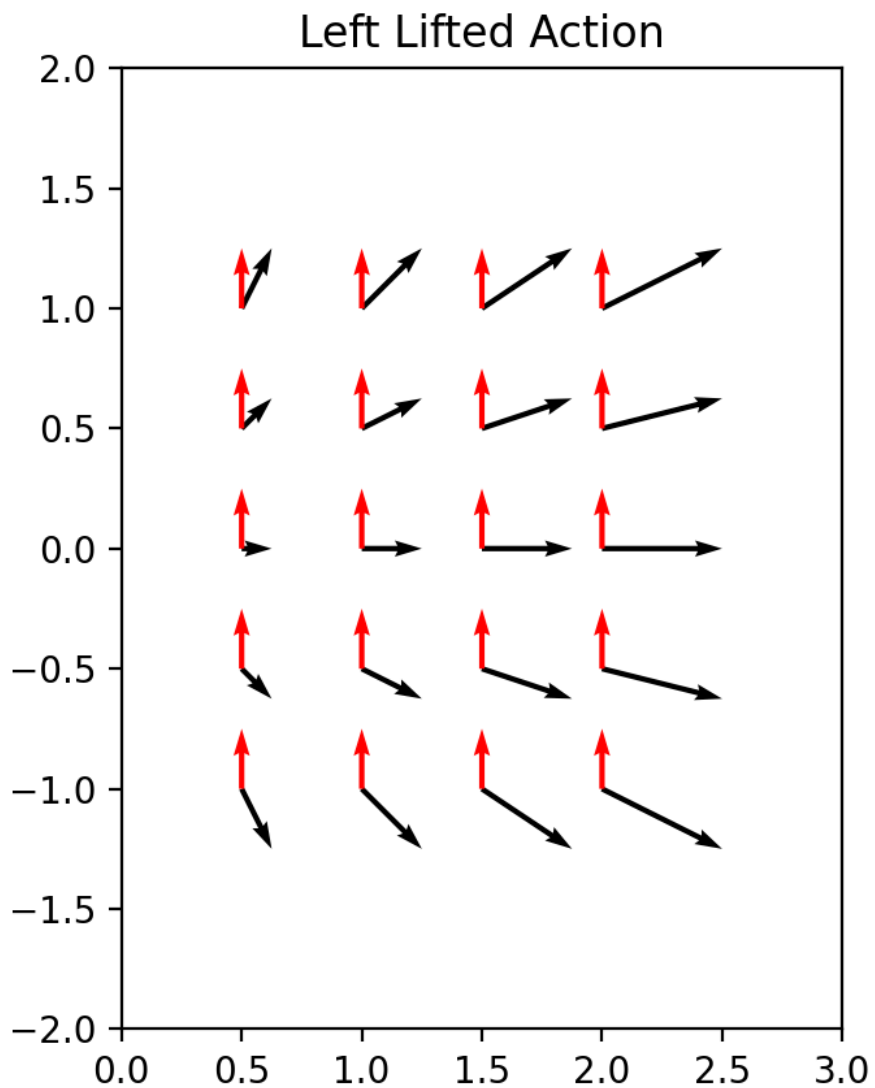
Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Lifted Action Functions with Right-Lifted Action

Part 4 Deliverable 2:

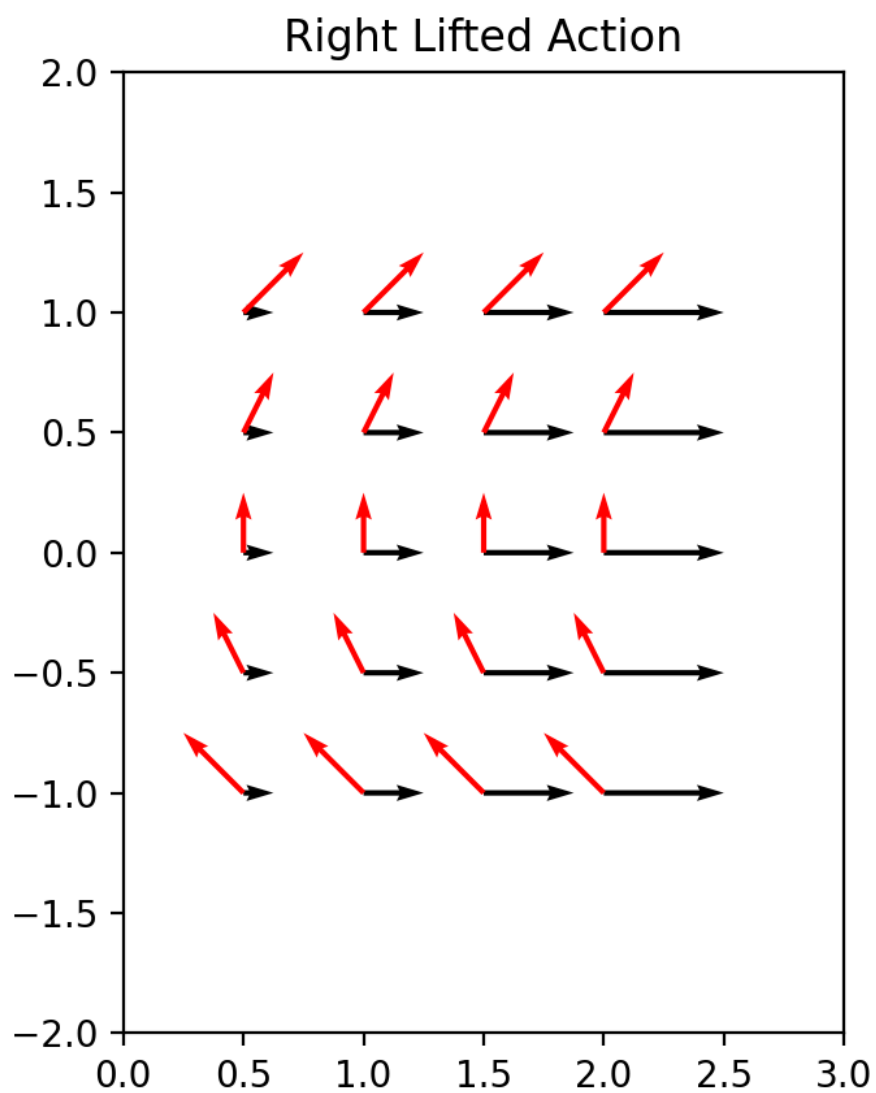


Caption: Illustration Demonstrating Adjoint Velocities on Scale-Shift Group

Part 6 Deliverables:

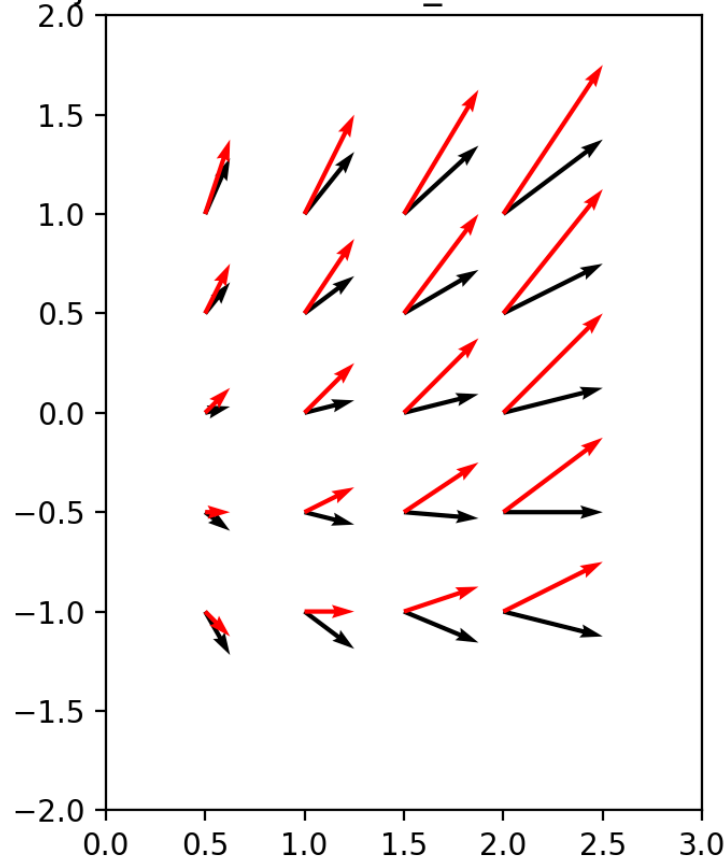


Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Lifted Action Functions with Left-Lifted Action Using Matrix Representation



Caption: Illustration Demonstrating Groupwise Vector Basis Fields Using Lifted Action Functions with Right-Lifted Action Using Matrix Representation

Adjoint and Adjoint Inverse with G_{circ} with matrix representation



Caption: Illustration Demonstrating Adjoint Velocities on Scale-Shift Group Using Matrix Representation

Part 7 Deliverables:

Did not have time to implement

Reflection:

How much time was spent:

- Over 40 hours

What was easy

- I think I understand left and right actions but it was not easy. I am still confused about the rest of the assignment and am still working to understand lifted actions, adjoints, and how to implement all of this with $SE(2)$ instead of just scale-shift
- Going over examples in office hours with actual numbers or a, b, c, d in the matrices and working out the math really helps me understand better

What was hard:

- I had a hard time with the whole assignment. Even when asking questions in office hours I feel like I am missing a good background in math, mechanical engineering, and programming. Trying to learn the math and how to code it at the same time has been very confusing.
- The changes in notation from g and h to g_1 and g_2 and other notations are really confusing to me and when trying to implement the math in code I get very confused about what variables are g and which ones are h .
- I also got confused about when we were supposed to get values by looking at the graphs in the book and when we were supposed to calculate values from previous values so making that more clear in the assignment would've been nice.

Here is the link to my public ROB541 github repository:

<https://github.com/chelsevanatter/ROB541.git>