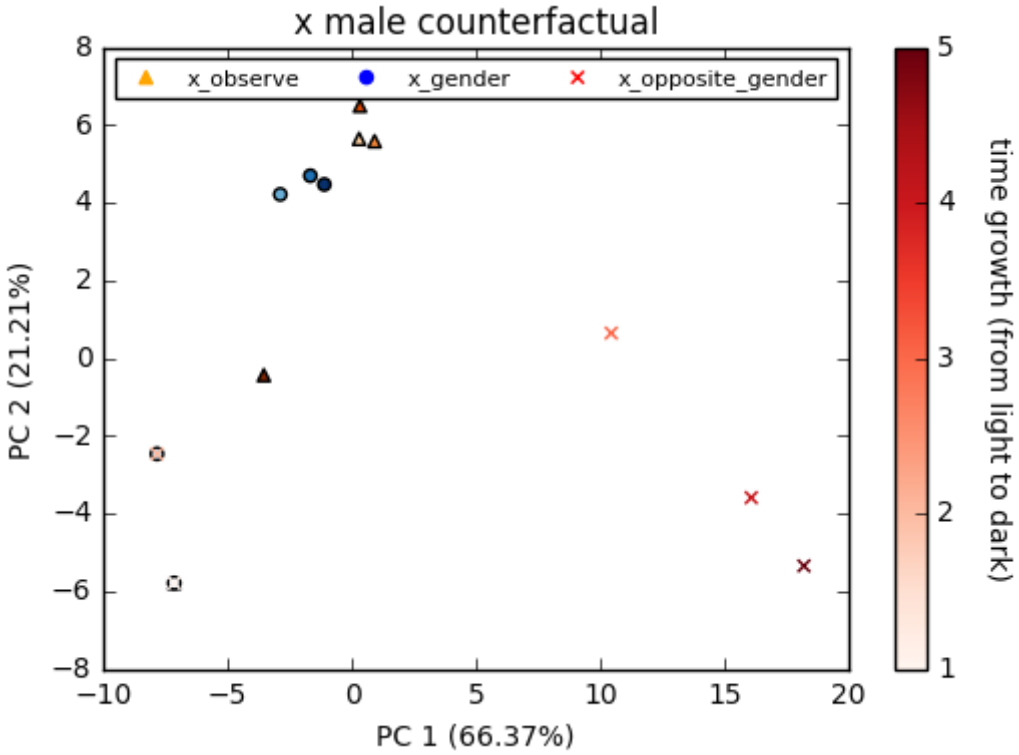
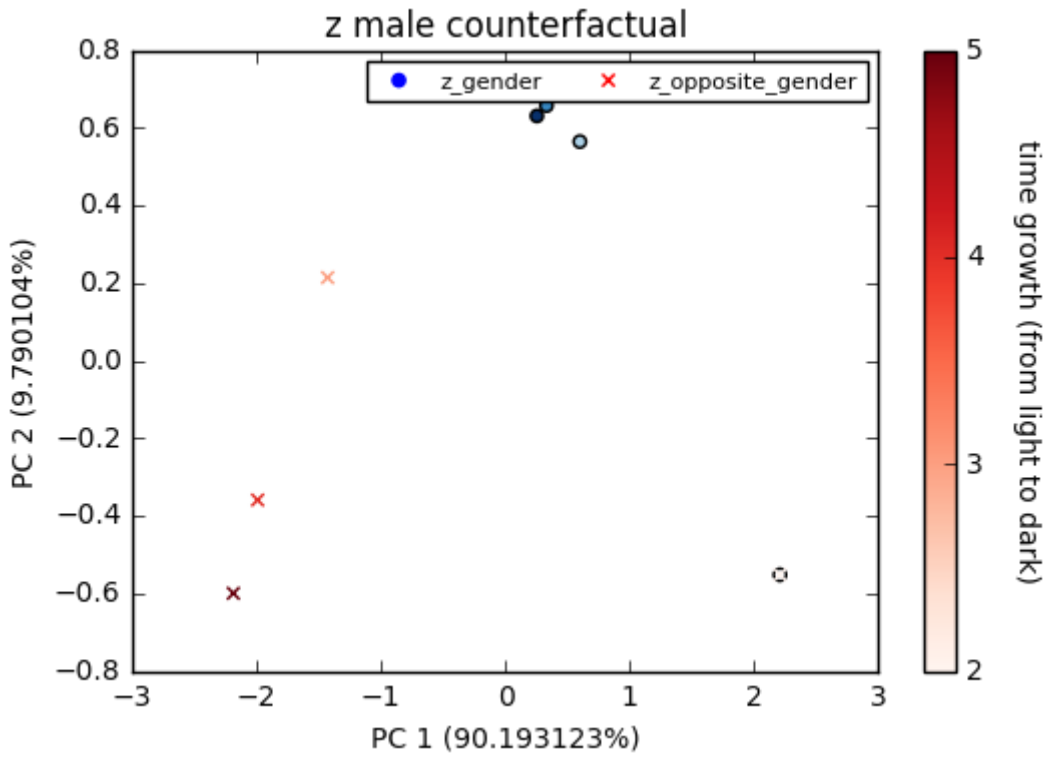
Counterfactual analysis

I treat gender and each time point as independent actions, and then I do a 'female' actions on a male mouse starting from t=2 and do a 'male' actions on a female mouse from t=2.

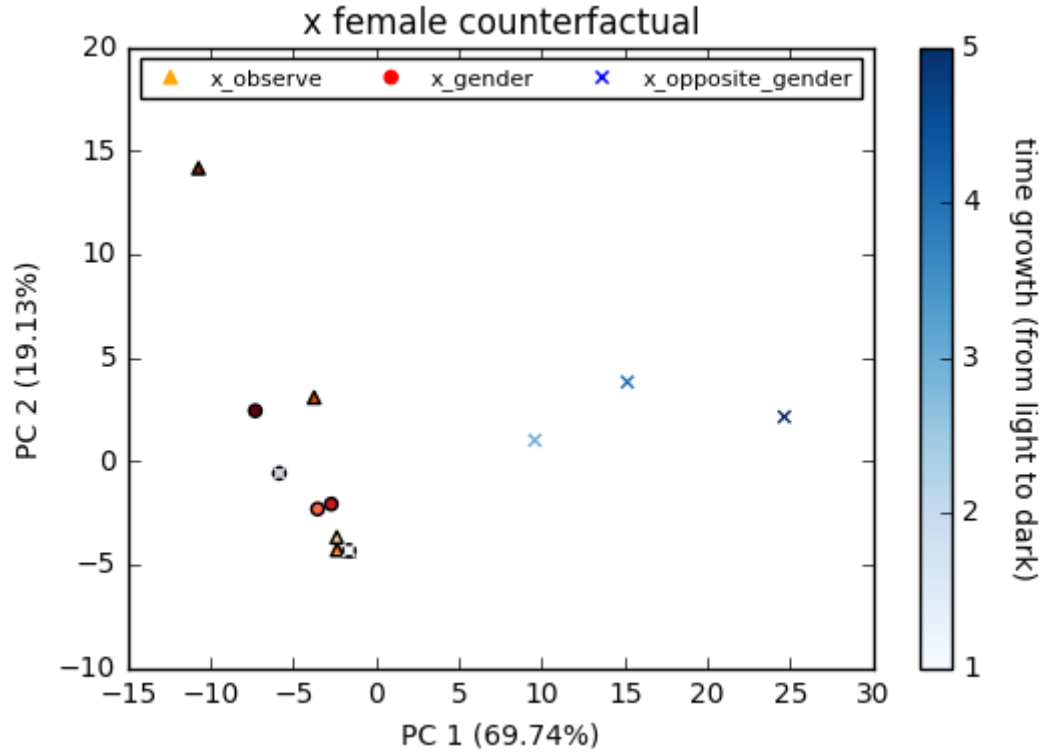


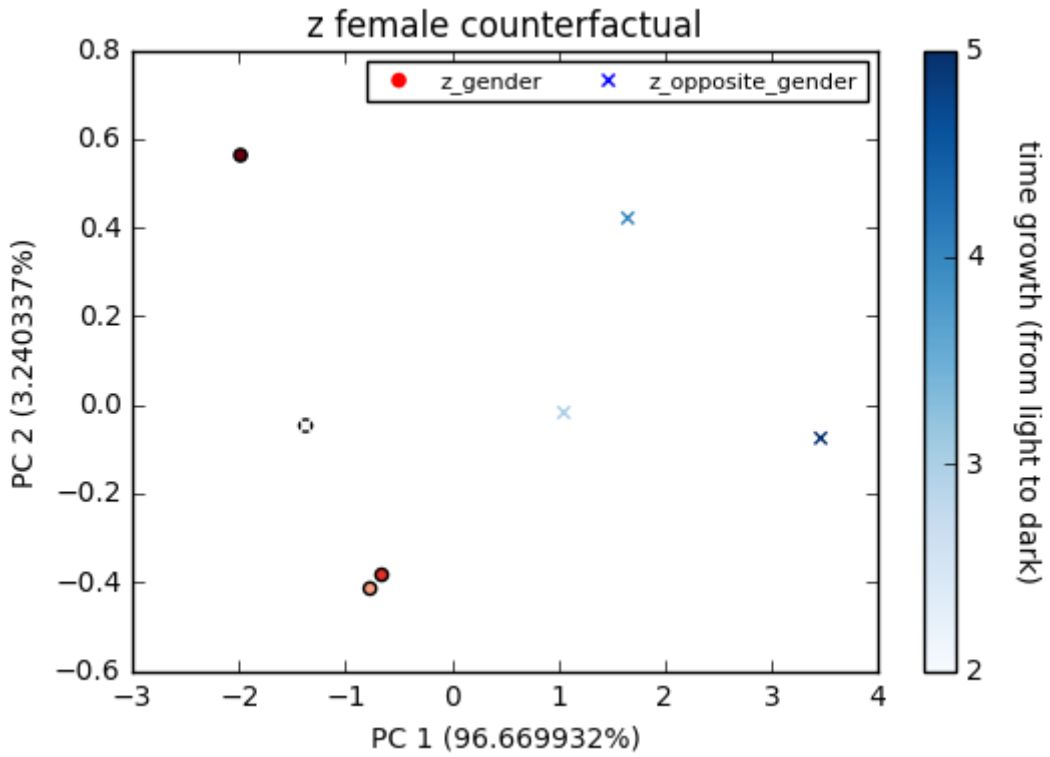
In this case this is a male mouse with hyppothalamus tissue of 183 genes and use PCA to project to 2 dims.
x_observe means the original observations.
x_gender is that we use 'male' actions starting from t=2 and observe its gene expression change.
x_opposite_gender is that we use 'female' actions starting from t=2 and observe its gene expression change.
All these 3 are the same in t=1. So they are all white in the left down corner. x_gender and x_opposite_gender starts diverging in t=3.



This is the hidden state for t=2 to 5. When t=2, these 2 are the same but diverges in t=3.

This is for female and do the 'male' actions




z female counterfactual
z_gender
z_opposite_gender
PC 2 (3.240337%)
PC 1 (96.669932%)
time growth (from light to dark)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−3
−2
−1
0
1
2
3
4
5
4
3
2

In [ ]: