**Meeting attendees.**

Xia Jiang,  Garrett Barber

**Meeting time**

10:00 – 11:00 am, Jan 18, 2023

**Meeting agenda (an addition meeting in response to an email question).**

1. Review the progress of the work assigned last week.
2. Discussed some of the issues regarding iRCT and the causal learning package. rFCI and FGS are still working. Suggest Garrett to look into other implementations hosted at the CCD such as the java version. In terms of iRCT, Garrett mentioned the three approaches he used so far: the original according Dr. Jiang’s algorithm on her slides, which was too slow, the one that uses the propensity score, which is also quite slow, and the better version that he added, which runs much faster.
3. We also discussed the issue of the current PC that we downloaded from CCD, that is the output of it does not match the expected output using the algorithm and the testing datasets that Dr. Jiang provided, given that we used the same alpha (0.05). Garrett found that the reason is the p-Values computed by the current version of PC don’t match the p-Values that Dr. Jiang provided, which she generated using the MXM package. But Garret also found that if we lower the alpha from 0.05 to 0.02 for the current version of PC, the results are getting close to the ground truth.
4. We also discussed how to enhance the readme files for each of the packages that Garrett has worked on including MBIL, iRCT, and CausalLaearning.
5. We also discussed the progress in terms writing the paper/tech report and future plans. Currently not much as been done.
6. Work assignment.

**Research Design**

iRCT – an intelligent pseudo randomized controlled trial.

1. Implement the simple matching estimator method as described in Jiang’s slide (AboutDID.pptx).
2. Created a simple test dataset using the same example Jiang used in her slides.
3. Test 1) with the dataset created in 2).
4. Include a transform function in our iRCT (See the MBIL package) that can convert all the covariates into one variable (such as the X in the example).
5. Develop a function that convert multi-value variables into a binary variable and include it in the iRCT pacakge.
6. Apply iRCT to our LSM-15year.
7. Identify more interesting “treatment” variables such as Menopausal status in our LSM-15 year, use method developed in 5) to convert them into binary each respectively, if they are non-binary. Then apply iRCT each respectively.
8. Compare what you learned from using iRCT with what you can learn from our MBIL methods, and from the other causal learning methods that we have access to.
9. In terms of the completed causal network, such as the you (Garrett) learned using FCI with our LSM-15year, you can just retrieve the direct causes to the target variable (BCM) and compare with our MBIL and iRCT.

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**Progress made in the past week.**

As shown by Garrett’s file called /Users/xij6/Documents/Research/git/XiaJiang-2Github/iRCT/docs/Garrett's findings for 1.18.23 meeting.docx

**Issues/Questions and Comments**

As shown in Meeting agenda above

**Ongoing tasks that cover more than a week**

**Specific tasks for the coming week (the original task assignment for two weeks)**

1. Understand the MXM R package that Dr. Jiang mentioned in her email and learn how to use it to do the conditional independent test.
2. Incorporate the independent test mechanism from MXM R package to the current version of PC that we have, document the work and update the readme about this.
3. Looking into the other implementations of rFCI and FGS in CCD, for example the JAVA version. Once identify a “working” version, convert it to a python package to be included in our causal learning package. If can’t find a “working” version, then develop our own packages that truly work.
4. Resume the functions regarding the three versions of iRCT created during the development phase, update the readme, and the tech report describing them in detail and explaining why running times are different.
5. Enhance all readme files. For example, in term of MBIL, we need to add a link to the version submitted to the python community in the readme; and also add and explain all function including the transformation function.
6. In terms of iRCT, for now, we just treat it as the supervising learning methods similar to MBIL. We can compare it to both MBIL and the results of causal learning methods.
7. Work on the tech reports/papers.

**Less urgent tasks**