

Slide #	Summary	Theoretical/Technical/Informational	Concept	Week
2-5	<ul style="list-style-type: none"><li>• Introduction to causal analysis</li><li>• Motivation for causal inference/discovery</li></ul>	Informational	Causal Analysis	0
6-10	<ul style="list-style-type: none"><li>• Introduction to DoWhy (what is it)</li><li>• Main functionalities/capabilities of DoWhy</li><li>• Major pros/cons of DoWhy</li></ul>	Informational	DoWhy	0
14-17	<ul style="list-style-type: none"><li>• Tetrad, causalml, causal discovery toolbox, causalnex (pros/cons)</li></ul>	Informational	Tetrad, causal discovery toolbox, causalnex	1/2
18	<ul style="list-style-type: none"><li>• Summary table to compile the analysis and research on the 5 different tools related/dedicated to causal analysis</li><li>• Note that a revised version was sent separately</li></ul>	Informational	Summary table	1/2/3
20	<ul style="list-style-type: none"><li>• Short intro to quasi-experimental design</li><li>• Comparison between experimental design and quasi-experimental design</li></ul>	Theoretical	Quasi-experimental design	1/2
24-27	<ul style="list-style-type: none"><li>• Screenshots of graph-based apis that are used o the backend</li><li>• Main point is that all the tools have network capabilities</li></ul>	Technical	Networkx	3
29-35	<ul style="list-style-type: none"><li>• Analysis conducted to compare the performance of DoWhy and causalnex on the Sachs dataset</li><li>• Contains information about<ol style="list-style-type: none"><li>1. Causal graph refutations</li><li>2. Causal estimate refutations</li></ol></li></ul>	Technical	DoWhy & Causalnex	4
36-40	<ul style="list-style-type: none"><li>• Refutations in DoWhy with specific api references to validate causal graphs</li><li>• Causal minimality is also explained</li></ul>	Informational and Technical	DoWhy	5
42	<ul style="list-style-type: none"><li>• Diagram of the pipeline to be used when performing effect estimation</li></ul>	Technical	DoWhy	6
43	<ul style="list-style-type: none"><li>• Refutations of causal graphs in DoWhy – but a bird’s eye view</li></ul>	Informational	DoWhy	6
45	<ul style="list-style-type: none"><li>• List of causal tasks that can be done with DoWhy</li></ul>	Informational	DoWhy	6
46	<ul style="list-style-type: none"><li>• Formal definition of effect estimation</li></ul>	Theoretical	Effect Estimation	6
48	<ul style="list-style-type: none"><li>• causal-learn doesn’t provide a verified way of injecting background knowledge at-the-time of search</li></ul>	Theoretical	Knowledge Injection	7/8
49	<ul style="list-style-type: none"><li>• There is a critical difference between interventional and counterfactual data</li></ul>	Theoretical	Interventional vs Counterfactual data	7/8
50-51	<ul style="list-style-type: none"><li>• Graphical causal models in DoWhy are different than vanilla causal models in the sense that vanilla causal models do not contain information about the causal mechanisms</li></ul>	Technical	DoWhy	7/8
52	<ul style="list-style-type: none"><li>• Anomaly attribution is a common task that a user may ask of a dataset</li><li>• In particular, the question is <i>what has caused the outlier in my dataset?</i></li><li>• Isolated Forest is a popular choice for anomaly detection</li></ul>	Theoretical and Technical	Anomaly Detection	7/8