Annex to the HCSS-LIACS PhD Vacancy (January 2021): An outline of the problems to be solved in the PhD project in application domain terms

The Hague Centre for Strategic Studies (HCSS) develops conflict and security policy modeling applications. We use causal modeling to identify and estimate causes of violent political conflicts. For example, in our ongoing award-winning, "Water, Peace, and Security" project, we identify and estimate causal effects of water, food, energy, and climate risks on violent political conflicts. Our effort to casually model violent conflict is also intended to generate a taxonomy of different pathways to violent conflict. Moreover, we use causal modeling to specify and optimize efficacy of causal interventions into such conflicts. Hence, our objective is dual: First, we want to get a better grip on causality in complex social systems. Second, we want to assess how policymakers can optimally intervene into causes of distinct types of violent conflicts.

Along these lines, we want to develop, validate, and deploy causal models that identify and estimate different natural conflict pathways using existing domain knowledge. At the same time, we want to optimize the efficacy of interventions into causes of violent conflicts under a host of causally relevant constraints. Some of these constraints are natural while others are derived from policy.

In this latter context, we assess how to inoculate a causal intervention into a violent conflict against attacks that are intended to deprive the intervention of its efficacy. Our objective is to optimally trade the intervention's efficacy for its resilience to being strategically contested. We are subjecting the optimization of the intervention's efficacy to strategic interaction among adversarial policymakers.

Furthermore, we analyze how to inoculate a causal intervention into a violent conflict against voting and agenda attacks that are intended to deprive the intervention of its efficacy. Our objective is to optimally trade the intervention's efficacy for its political feasibility. Not only are we subjecting the optimization of the intervention's efficacy to the policymakers' strategic interaction, but also to the intervention's dependence on the tally of policymakers' votes. Specifically, by formulating the intervention as one of several interventions on a governing body's voting agenda, we are embedding the strategic interaction-related constraints into the governing body.

Finally, solutions to the above problems apply optimization to causal modeling of conflict. Validation of such solutions requires causal models of several conflict pathways to be identified and estimated, before the efficacy of a causal intervention into each of these conflict pathways can be respectively specified and optimized.

Therefore, the doctoral research should result in detection of causal pathways that lead to a violent conflict in complex social systems, optimization of causal interventions into such pathways, as well as their optimization in the light of adversarial strategies. Thus, the scientific contribution to be made requires expertise in causality, optimization, and conflict modeling.