In this thesis, we study ways in which computational social choice can contribute to social good, by providing better democratic representation and by allocating scarce goods. On the side of political representation, we study multiple emerging innovations to the democratic process. If legislative elections with proportional representation allow for approval-based ballots rather than the choice of a single party, we give voting rules that satisfy attractive axioms of proportionality. For liquid democracy, a kind of transitive proxy voting, we show how an extension to multiple delegation options can decrease the concentration of power in few hands. Finally, for sortition, a system in which representatives are randomly selected citizens, we develop sampling algorithms, both for the case where all citizens participate if sampled and for the case in which participants self select. Concerning the allocation of scarce goods, we investigate the applications of refugee resettlement and kidney exchange. For refugee resettlement, we show how submodular optimization can lead to more diverse matchings that might increase employment by reducing competition for jobs between similar refugees. In kidney exchange, we give approximately incentive-compatible mechanisms for transplant chains in a semi-random model of compatibilities. Finally, we present three directions for future research, revisiting the topics of sortition, refugee resettlement, and semi-random models.

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Thesis Summary: https://paulgoelz.de/other/proposal.pdf