

Thesis Portfolio

Labor Assigner Program for Twin Oaks Community
(Technical Report)

Labor Assigning and Twin Oaks Community
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
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Bachelor of Science, School of Engineering

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Department of Computer Science

Sociotechnical Synthesis

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This is the end of my time at the University of Virginia. It seems only appropriate that my thesis relates to my start. My thesis is on Twin Oaks Community. I was born and raised there. Twin Oaks is an intentional, egalitarian, and sustainable community. It was founded in the 1960s with the rise of the free love movement and still clings very strongly to those roots. Twin Oaks has about 100 members. My thesis relates to Twin Oaks's labor scheduling. I'll first talk about my capstone and then my STS research.

My capstone is a computer program that is designed to automate the labor assigning at Twin Oaks. There is a lot of work that needs to be done at Twin Oaks and organizing that work is time consuming. It takes one person about four days to schedule everyone's labor. My program would be faster. The core algorithm it uses is a program called max flow. Unfortunately, after working on this project for quite some time, I found that max flow is not sufficient to deal with the incredible flexibility of Twin Oaks's scheduling. So my capstone is not a fully functioning labor assigner. However, much of the work that I did do will still be beneficial going forward. I conducted fairly extensive interviews with Twin Oakers to find out exactly how the labor assigning worked and what they would like this program to accomplish. That, and much of my code, will be enormously beneficial as I continue working on this project after college. My STS research followed a very similar vein.

My STS research paper is on the history of work scheduling as it pertains to Twin Oaks. It starts with the development of the tools needed for scheduling, and continues with how those tools gained prominence during the industrial revolution. It was also during this time that scheduling became a formal trade and area of study. The paper then talks about Twin Oaks's scheduling. It describes some of the most significant changes that have happened to it in the 50

years since Twin Oaks was founded. It concludes with a description of my capstone, as it will be yet another change in the history of Twin Oaks's scheduling.

Conclusion

Doing these two projects together has taught me a lot. One of the main things it's taught me is that my capstone can inspire change. Growing up at Twin Oaks I always saw our labor system as this immutable object. It had been around for so long and seemed like such a core part of Twin Oaks. But researching Twin Oaks's history changed that. I learned how much the system has morphed over the years. I learned that big changes were possible, so why couldn't my program be accepted and used? That's what I learned from my research project but I also learned a lot from my STS classes in general. I learned that computers and humans are intimately connected, and that a person should not make a program without first considering the human aspect. That's why I talked to the people of Twin Oaks. I wanted to make sure this was a program they wanted, and to make sure I knew what they wanted it to do. That's also why I assembled a group of Twin Oakers to help me consider how best this program could serve its members. I think that is the most important takeaway I have from my STS classes: technology is meant to serve people, all people, and if it doesn't do that then it should not be made. My capstone will serve the people of Twin Oaks. It will not discriminate or marginalize anyone. That is not just a consideration, it's a core feature.

Finally, I'd like to thank the many people who helped me make my thesis. Thank you Keenan Dakota, my dad, for getting me all the real-world data I needed from Twin Oaks to test my capstone. To the team of Twin Oakers who helped me figure out what features my capstone should have, what it should look like, and how best it can integrate with Twin Oaks, thank you. You are, in no particular order, Kathryn, Summer, Kelpie, Jen, Tony, and Graham. And finally,

I'd like to thank Keegan Dunn. Thank you for helping come up with ideas for my STS research paper as well as help me structure and edit it. Also, thank you for pushing me to further my education. Without you I'd probably still be milking cows at Twin Oaks.

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