

Undergraduate Thesis Prospectus

Improving Predictive Maintenance: How Machine Learning Can Prevent Failures (technical research project in Computer Science)

Telecommuters and Impression Management in a Digital Age (sociotechnical research project)

by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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General Research Problem

How can employees most efficiently benefit from technological advances?

Technological innovation can promote economic growth, but it also exacerbates economic inequality. Acemoglu and Restrepo (2017) found that one more robot per thousand workers reduces the employment to population ratio by 0.18-0.34 percent and wages by 0.25-0.5 percent. Industrial robots reduce labor costs but often impair economic opportunity (Garza & Zorthian, 2020).

Workers, however, can use technology to organize in response to employment threats. In 2018, for example, West Virginia teachers used Facebook to organize “nearly 24,000 members” in support of a strike (Kunkel, 2018).

Improving Predictive Maintenance: How Machine Learning Can Prevent Failures

How can machine learning improve predictive maintenance for Norwegian hydroelectric generators?

I have no assigned technical advisor or project, and the above question represents my expected research topic. Because of this, and by advice of my general advisor, I am postponing the development of my technical paper until Spring 2023.

Telecommuters and Impression Management in a Digital Age

How do workers promote telecommuting and secure the trust of managers given managerial bias against remote work?

How can remote workers battle managers’ preconceived notions of telecommuting? Remote work tripled from 5.7% in 2019 to 17.9% in 2021 (Bureau, 2021). This warrants further

investigation: how can leadership evolve to fit a new medium, where managers have struggled to adapt to new mediums, and how remote workers have appealed to managerial notions to further encourage the transition from an in-person to a digital workplace.

Participants include the leadership of corporations in two main forms. First, those who advocate for supporting their workers' desired level of working from home, usually because of a perceived increase in inclusivity and no noticeable drop in intrateam relationship quality (Dell, 2022). However, the second main group prefer an "only if necessary" stance, usually from a perceived drop in comradery and lack of workplace amenities (Cheng, 2017).

Participants also include remote workers of varying desire to leave full-time office occupation. According to ADP's *People at Work 2022* report, "64% of the workforce would consider looking for a new job if required to return to the office fulltime." However, many workers dread the possibility of long term remote work because of decreased work-life balance, video chat fatigue, and a decrease in spontaneous conversations (Thompson, 2020).

The executive level employees should also be considered, as they often receive more consideration. For instance, when Tesla's commuting policy released, the executive suite resisted the strict requirements for remote work (Berger, 2022).

Researchers have investigated managers' responses towards different forms of impression management (IM). While "boot-lickers," or more formally, "actors who knowingly engage in ingratiation" are often distrusted, this only holds when the target believes the actor is doing so purposefully (Long, 2021). However, Long later suggests that when an employee authentically ingratiates their supervisor, "the target would see such behavior as a signal that the actor should be trusted." Other research differentiates between face to face and online IM, as well as direct or indirect IM (Al-Shatti & Ohana, 2021). Indeed, "66 percent of employers say

they use search engines to conduct research on potential job candidates,” demonstrating the role indirect IM plays in the modern era (CareerBuilder, 2018).

However, none of the research answers how an employee could benefit from the advantages of remote work while remaining competitive with those in office. How can employees counteract the highly valued proximity bias with CEOs like Musk stating “The more senior you are, the more visible must be your presence,” (Mac, 2022)? What alternative technology could help communicate non-verbal communication to increase authenticity during impression management?

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