

# **THESIS PROJECT PORTFOLIO**

## **Decolonizing Engineering Curriculum to Design an Equitable Society**

(Technical Report)

## **An Ethical Lens to UVA Engineering Curriculum: How White Supremacy is Built-In through Normalized Deviance**

(STS Research Paper)

An Undergraduate Thesis

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#### **AN ETHICAL LENSE TO UVA ENGINEERING CURRICULUM: HOW WHITE SUPREMACY IS BUILT-IN THROUGH NORMALIZED DEVIANCE**

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After the protests in response to George Floyd and Breonna Taylor's murders, universities, corporations, and leaders were called to be accountable for their role in perpetuating violent racism and the history of white supremacy in the United States. Engineers also responded to these events in the *Journal on Engineering Education's* October 2020 issue. Here, engineering professors highlight how the engineering curriculum and the discipline contribute to upholding white supremacy. The journal focuses on how the influence of the industrial revolution, colonization, and capitalism have centered engineering education curriculum and pedagogy around the white and male perspective (Kelly C., 2020). In response to this journal, I focused my STS and technical research around decolonizing the engineering education curriculum. On the sociotechnical side, I investigated how white supremacy was present in the University of Virginia's (UVA) School of Engineering and Applied Sciences (SEAS) using Actor Network Theory (ANT) and the concept of normalized deviance. From this theoretical work I then designed multiple educational interventions and goals for addressing white supremacy in engineering through STRIVE (Students and Teachers Revolutionizing Inclusivity Values in Engineering). STRIVE was developed as an undergraduate advocacy group that advanced diversity, equity, and inclusivity (DEI) goals in SEAS. The combination of the sociotechnical and technical work contributed to DEI conversations in SEAS.

For this research, the sociotechnical work focused on how white supremacy is ingrained in engineering and at UVA through normalized deviance. The normalization of deviance is "the process by which deviance from correct or proper behavior becomes normalized in a culture" (Vaughan, 1996). Given the basis that proper behavior would include diversity, equity, and inclusion, the wide span of discriminatory experiences in engineering curriculum, let alone higher education, qualifies as a normalization of deviance. Here, I investigated how white

supremacy has been normalized in engineering curriculum and training programs and specifically at UVA. This work took extensive literature review that highlighted a culture of white supremacy at UVA since its foundation. Combined, the themes of white supremacy in engineering and the context of UVA's history creates a harmful environment for underrepresented and racially marginalized (URM) students.

As a technical solution, STRIVE developed a six-year framework to tangibly provide a plan for interventions, programs, and further research on equity in the SEAS curriculum. This plan contains short, mid, and long-term interventions that specifically address the culture of white supremacy at UVA, which furthers the prioritization of western male perspectives in SEAS. These interventions addressed calls from the Black Charlottesville community to have educational programming that accountably addresses UVA's history of slavery, white supremacy, and racism. After diagramming the components of this socio-technical problem, the ANT highlighted that western cultural influences and people had the largest influence over the SEAS curriculum. The actor-network theory is the "framework and systematic way to consider the infrastructure surrounding technological achievements. Assigns agency to both human and non-human actors (e.g. artifacts)" (David L., 2020). The interventions were developed by analyzing the actors of the engineering curriculum that are specific to UVA's historical context and targeted human opinions, reflections, and biases. These interventions are supported on the social side, with the analysis between SEAS and engineering programs explicitly prioritizing equity ANT frameworks.

White supremacy has shaped engineering. Discrimination became key to the profession through its development during colonization and the Industrial Revolution and continues to shape the experiences of URM students at predominantly white institutions (PWIs) like UVA.

These legacies have normalized white supremacy and racism at these institutions. This is the normalization of deviant behavior and administrators must hold their schools accountable for their histories and perpetuation of racism. Institutions can begin to address this normalized deviance by accountably educating their students on the influence of racism in the profession, the university, and their lives. Further, universities should rethink their core engineering experiences to specifically prioritize social justice and diversity, equity, and inclusion. By accountably addressing contributions to white supremacy and prioritizing social justice, engineering schools like the SEAS will more justly reach their goals of training engineers that promote the well-being of communities. Combining the long-term framework from STRIVE with current DEI initiatives will hopefully target cultural and interpersonal changes enough and build enough momentum of support to lead to complete analysis and restructuring of core engineering requirements.

## Resources

David, L. (2007, March 23). Actor-Network Theory (ANT). Retrieved October 4, 2021, from <https://www.learning-theories.com/actor-network-theory-ant.html>

Kelly, C. (October 2020). Racism is the manifestation of White supremacy and antiracism is the answer. The Research Journal for Engineering Education.