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Outdoor Lighting and Artificial Light at Night (ALAN)

Kirmser Undergraduate Research Award

Reflective Essay

Choosing a Project Topic:

A big part of the reason I chose to study architectural engineering was my interest in lighting. I love how lighting can shape a space, provide needed visibility, and create an atmosphere. I also enjoy the engineering side, unraveling the intricacies of voltage and current to make sure a space is safe and functional. However, my decision to choose outdoor lighting as a subject was as much emotional and nostalgic as it was practical. I grew up in the country and loved to lay on our trampoline at night and stare at the night sky, bewitched by the beauty of the stars. In my lighting classes, we talked briefly about outdoor lighting and light pollution, and those lectures always tugged on those memories and my heartstrings. Since those classes I had wanted to do a more in-depth study on environmental issues relating to lighting and how lighting designers can mitigate negative effects of artificial light at night (ALAN); my Written Communication for Engineers class turned out to be the perfect opportunity.

Research Strategies:

My end goal was to gather enough information to develop a set of “best practices” for outdoor lighting design. To start, I searched professional organizations in the lighting, design, and construction fields to determine what their stances and recommendations were on outdoor lighting. Then, I searched for studies on how ALAN affects humans, animals, and the environment. The last important part of my research was studying how light sources and indices like CCT and spectral content should affect decisions made by designers.

To keep track of my research, I saved any article that looked promising to pdf form and kept a running list of my sources. I read each source, highlighted important parts, and took bullet-point notes in a word document. My notes included the main points or claims of the source, any specific statistics or quotes that I thought I might want to use in the paper, and my thoughts about the conclusions of the source and whether I thought it was reliable.

Library Research Tools:

I started using the databases to find research articles, because that is what I had the most experience using in previous classes. I also found it very useful to look at the references that the articles I found cited, especially if they were from a more popular source. That way, I could go directly to the original source and make sure the findings had not been overstated or misinterpreted. The most useful tool I found was a research database managed by the International Dark Sky Association. This database, called the Artificial Light at Night (ALAN)

Research Literature Database, compiles research articles about ALAN. By searching in this database, I was able to find all the research I needed fairly easily. Many of these articles were open source or on a database that I had access to through the K-State library. I requested the ones that were not through the interlibrary loan system and received what I needed promptly.

Finding information:

Once I discovered the ALAN database, I did not have any issue finding the information I needed. I had a clear picture of the information I needed, so it was easy to search for terms like “lighting and road safety” or “CCT and plants,” find the reference to the article I needed, and determine if I could use my K-State credentials or if I needed to request it through the ILL system.

Evaluating information:

Most of the sources I used were from peer-reviewed journals and were found to be reliable. The sources that I was especially careful in vetting were articles and statements from professional organizations, which I mostly used to speak to how the public and the industry views outdoor lighting. For example, I found the American Medical Associations report to be not particularly convincing; they seemed to pull their conclusions from nowhere and cited questionable sources, like the website HowStuffWorks. However, they did cite some research articles that I was able to track down and use.