Ambient Light Temperature

Of Select Pedestrian Areas on the University of Cincinnati's Campus

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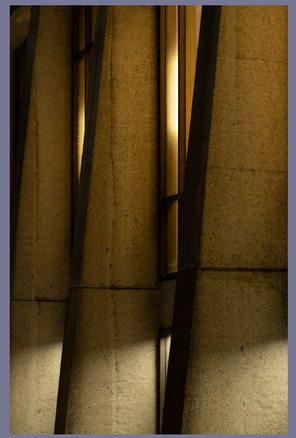
Intro/Abstract

Summary of Project

This project presents an analysis of ambient light temperature across select areas of the university campus, investigating how lighting environments shape spatial perception, pedestrian comfort, and nighttime usability. Using a method with systematic data collection, variations in color temperature were captured and measured in Kelvin, at multiple locations during evening hours. These measurements were processed, mapped, and visualized to reveal spatial patterns that are often overlooked in conventional lighting assessments.

The resulting visualizations highlight meaningful contrasts between warm and cool light, inconsistencies in fixture performance, and areas where lighting conditions may influence safety, way-finding, or the overall character of the built environment.

By integrating recorded field data with spatial techniques, this study illustrates how light can be measured as both a physical and experiential element of urban space. This project contributes to broader conversations in urban design, campus planning, and environmental analysis by demonstrating the value of spatial lighting data as a tool for evaluating public space and informing future improvements.



Concept & Purpose

Why measure ambient light

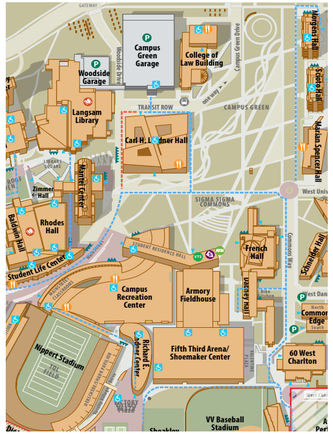
Ambient light plays an important role in how students and visitors experience the UC campus after dark, influencing everything from perceived safety to the overall clarity and character of shared spaces. Yet lighting conditions are rarely recorded with the same focus as other campus infrastructure. By measuring the ambient light temperature across the campus, planners can translate the subjective nighttime experiences into spatial data.

Mapping these differences show where lighting supports UC's goals for walkability and campus cohesion, and where inconsistent color temperatures or under-lit areas may create discomfort or hinder wayfinding. The purpose of this study is to provide a clearer picture of the campus's nighttime environment, create evidence that can inform future planning, enhance public design, and support a more accessible and inviting campus experience.

Site Context

About the site location

University of Cincinnati's campus is around 250 acres of mixed spaces nestled into the heart of the Clifton neighborhood while bordering Corryville. The campus is only 10 minutes outside of downtown and is a core part of the Uptown area of Clifton Heights, University Heights, and Fairview (CUF) with a mix of vibrant student life on and around campus.

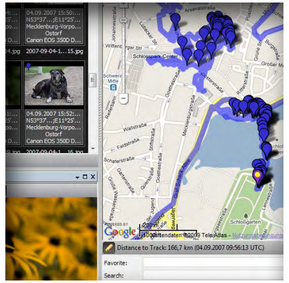


Equipment
Tools used in the project

Capture Process
Technique used to measure temperature

Sony A7R III Mirrorless Camera
Calibrite ColorChecker Chip Chart & Whitecard
Geotag Alpha

Using the Calibrite Chart and Whitecard, numerous RAW photos were taken to capture the ambient light around campus, with Geotag Alpha tagging each photo's GPS coordinates.



GeoSetter
Adobe Photoshop

GPS data and Temperature are recorded using GeoSetter and Adobe Photoshop respectively.

Adobe Illustrator
Microsoft Excel

These photos along with the data are then cataloged into an Excel spreadsheet for later use.

Data Extraction & Processing

Processing captured measurements

RAW photo with GPS meta-tagging through Geotag Alpha

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Reading of ambient light captured using Calibration Chart

↓

Whitebalance reading recorded in Photoshop

↓

GPS location recorded through Geosetter

↓

Data recorded into Excel spreadsheet

↓

Temperature and Location
Mapped through Adobe Illustrator

Map
With reference photos

Warmer — Cooler

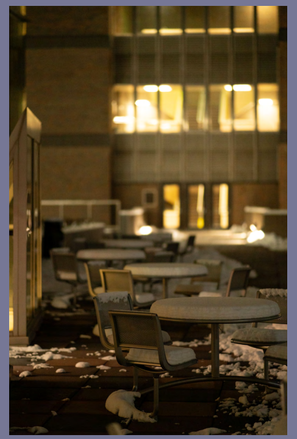
2800K — 3800K

Point of Measurement

Canvasing Area

3800K+ (Very Cool/White)

0" 1"
0' 333'
N



Insight & Interpretation

What was discovered through the project

UC's campus has grown through decades of layered development. The various clusters of common ambient temperatures across the grounds are reflected of this. Spaces of high traffic and openness tend to lean toward the cooler temperatures, typical of areas needing lighting that provides clarity and a sense of safeness. Older structures and spaces tend to lean toward the warmer temperatures, indicative of historic construction techniques and fixtures.

While the cooler spaces provide better visibility and safety, they tend to be unpleasant to spend time in, with it being more comfortable to pass through the spaces then linger. The warmer spaces, while not as properly lit, embody a more welcome and cozier atmosphere, with more of these spaces having plentiful seating and amenities for public usage.

Not all spaces followed this trend, with some newer structures and spaces using warmer lighting, while a handful of older structures and spaces having cooler fixtures intentionally placed at key intersections or passages.

Design Reflection

Processes of visually representing the data collected

The creation of the visual representation of this data came with challenges. A simple but cohesive color palette was chosen that allowed for better readability of space and temperature.
While warmer lights are easily represented with candlelight-like colors, cooler light isn't necessarily cooler on the color spectrum. It is the addition of white that makes light cooler, like daylight for example with a temperature of 5500K.

Taking this into account, an analogous color palette was chosen, as well as a darker base color that embodied twilight hours while being pleasing to visually observe.

These colors are also used across this document to create a cohesive presentation of the data and its findings.

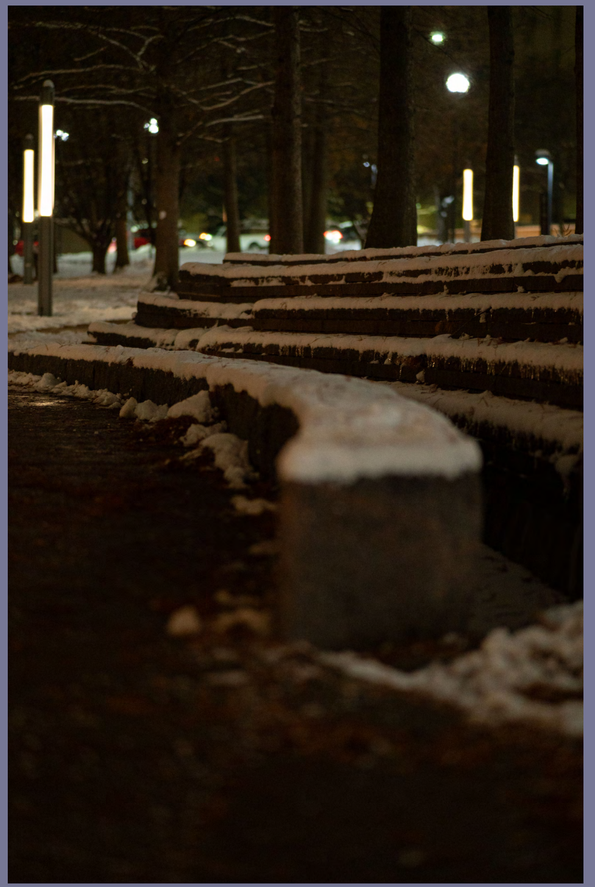
Challenges

Difficulties that arose during the project

Data collection of this scale can be time consuming, especially for an area as large as UC's campus. Do to lack of proper tools, the method used to capture readings was cumbersome and lengthened the process considerably.

Because of this, data recorded was an approximation—temperature readings where rounded to common values, coverage is not accurate when translated to the map, and variables like tint and luminance were not recorded. While the data is not physically accurate in the scientific sense, it still provides a clear semblance of the physical space's ambient lighting conditions.

The original canvasing area also was reduced because of time constraints, with prominent paths and locations chosen as a focus area. The original intention of this project was to canvas the entire campus grounds.



Implications

Conclusion of findings

This visual analysis demonstrates how ambient light plays a large role in shaping UC's nighttime environment. By documenting variations in color temperature across areas shaped by different eras of campus growth, the study reveals how inconsistent lighting can influence comfort, wayfinding, and the overall cohesion of the built environment. The resulting map provide a clear foundation for understanding where lighting supports pedestrian experience, and where targeted improvements could strengthen safety, identity, and continuity across campus.