

Graduate Student Research Abstract – Construction Practice (Non-Pedagogical Content)

A Framework to Support the Development of Manually Adjustable Light Shelf Technologies

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Active daylight harvesting technologies that are currently available in the market have often suffered from wide-spread market acceptability due to their high cost and imperfect performance. Passive systems, though simple and affordable, typically cannot harvest higher potentials of daylight, which is dynamic over days, months, and seasons, due to their static nature. There is a research and market gap that calls for investigation towards the development of low-tech, adjustable, high-performance daylighting mechanisms to be used as an alternative to active daylighting solutions, often controlled by building automation systems. This research will investigate a framework to support the development of daylight harvesting mechanisms, which will allow for low-tech yet adjustable systems, merging some of the advantages of active systems with passive systems into hybrid solutions, thus providing higher efficacy at lower cost. The hybrid of the above two categories will be a manually adjustable light harvesting device that will allow for quick adjustment through mechanical means to certain predefined positions that can be derived for its particular point of use. This will allow for flexible adjustment to variations of the sun's path in daily and/or seasonal cycles, or in overcast versus clear skies, while retaining a level of simplicity and elegance towards low-cost installation and operation.

Key Words: Light Shelf, Daylight Harvesting, Manually Adjustable Technologies, Framework Development.