



**Name of Candidate: Mamdouh Ahmed Farag Abdelkhair**

**Degree: DOCTOR OF PHILOSOPHY**

**Title of Thesis: (Proportion in architecture – The role of proportions in effect on the formation of the architectural product)**

**Supervisors: 1- Prof. Dr. Sherif Mohamed Sabry Elattar**

**2- Dr. MAGED Mohamed Aboeela**

**Department: Architecture**

**Approval: / /**

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**Proportions in architecture**  
**The role of proportions in effect on the formation of the architectural product**

**Prepared by:**  
**Mamdouh Ahmed Farag**

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In Architectural Engineering

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## **ABSTRACT**

Architectural proportions is a primary element of architectural design inputs.

The importance of architectural proportions changed between an input and output based on paradigm shift of architectural design approaches.

Proportions ends to be output of design process based on building performance and adoption with dynamic environment.

The study aim to develop smart skin proportions for optimizing illuminance levels inside office spaces. Through skin point in time response in order to adopt with dynamic daylight by computer simulation capabilities using parametric design methods, the aim of study achieved by creating a methodology consist of two sections.

The first is an electronic software methodology used to evaluate the performance of form proportions of intelligent dynamic facade through the simulation process to improve daylight illuminance levels inside space.

The second is a manual check list used to control and evaluate the simulation process steps, conditions, criteria, and metrics.

Research study explain the most famous intelligent dynamic skins expressions and the most important definitions, concepts, criteria, rating systems, and metrics, that describes natural daylight configurations.

The research study uses two hypothesis to check the performance quality of the designed methodology

The first hypothesis supposed that the intelligent dynamic skins improving the natural daylight levels inside office spaces in hot arid, more than using the static facade proportions.

The second hypothesis supposed that merging of different functional layers to dynamic skins with immediate response, improving daylight illuminance levels inside space, more than using single layer.

Research study allows to evaluate the intelligent dynamic skins proportions performance to optimize the most comfort illuminance levels, and produce a list of data that feeds the intelligent building system (BMS) to control the intelligent dynamic skin in order to activate best reaction to outside dynamic climate.