



Classification by Type of the Arches in Gaudí's Palau Güell

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Abstract Architects and historians commonly claim that when designing the Palau Güell, Gaudí experimented with some architectural elements which would influence his later works, with the arches being prevalent in the building. But, to date, no mathematically thorough study has been conducted in order to determine the type of each of such arches. Furthermore, literature contains subjective and intuitive claims which create ambiguity and contradictions. Owing to the methods used by Gaudí, the arches in Palau Güell are best fit by conical curves (ellipse, parabola, hyperbola) or hyperbolic-cosine curves (catenary, Rankine). Using photogrammetrical and mathematical techniques, in this paper we will classify the arches of this building according to their types, we will eliminate the inconsistencies which currently exist in literature, and we will obtain the corresponding analytical equations, which may be helpful in future studies.

Keywords Palau Güell · Antoni Gaudí · Arch · Geometric analysis · Conics · Catenary · Rankine

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