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**Empowering Industrial Design with Log-Aesthetic Curves**

**Abstract**

The basic elements of design are points, lines and curves which can be extended or manipulated to create visually pleasing industrial objects. Recently, a family of curves called Log-Aesthetic curves (LAC) has been introduced to substitute the de facto curves namely Bezier and B-Splines. LAC has a monotonic curvature function with three distinct shape variables  $\{\alpha, c_1, c_2\} \in \mathbb{R}$ . Numerous natural spirals can be represented using LAC formulation, e.g. when  $\alpha = \{-1, 0, 1, 2\}$ , LAC becomes clothoid, Neilsen's spiral, logarithmic spiral and circle involute respectively. The rest of two shape variables can be utilized for satisfying design constraints. This talk is divided into three parts where the first part introduces to the field of Computer-Aided Geometric Design (CAGD). It is then followed by the fundamentals of LAC and its unique traits that suit design environment with two examples of automobile and architecture design. The final part discusses on the extension of LAC to generate an obstacle-avoiding smooth path that optimizes minimum path distance, bending energy or curvature variation energy.