Computer design: modelling curves and surfaces

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Abstract: We describe a teaching experience achieved with a course named Numerical Methods for Design which is part of the first year's program of study for a university degree. Its goal is to make familiar students with concepts of virtual objects, through the knowledge of a 3D space and its related mathematical tools. The mathematical background given to the students is briefly illustrated and some typical applications are discussed. Our approach is characterised by a transform oriented vision of the reality. The student is solicited to consider any given shape under its generative aspect, in order to try to find out a possible way of getting this shape from different and simpler others by means of mathematically described transformations. The basic tool for this purpose is represented by the use of parametric vector equations. The most significant aspects of this teaching method are in our opinion the sense of achievement gained by the students who can rapidly manipulate and control complex shapes and a consequent higher familiarity with geometry and improved creativity.