

The similarity invariants of integral B-splines

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Let a transformation group G be given. and the algebra of G -invariant polynomials for m vector variables $x^{(1)}, x^{(2)}, \dots, x^{(m)}$ in 3-dimensional Euclidean space R^3 over the field R is denoted by $R[x^{(1)}, x^{(2)}, \dots, x^{(m)}]^G$. Then equivalence conditions of given m - vector variables in terms of the elements of the generator system of the field of G -invariant rational functions $R(x^{(1)}, x^{(2)}, \dots, x^{(m)})^G$. All of them in this Study in 3-dimensional Euclidean space R^3 the similarity transformations' group $S(3)$ and its main subgroup $LS(3)$ is considered as transformation group G .

Later integral B-spline curves and surfaces considered as very measurable examples are given. Because this curves and surfaces have a very important property which is invariance under affine transformations. So the similarity invariants of integral B- Splines are examined.

REFERENCES

- [1] Victor Maslov. On a new superposition principle for optimization problems. *Russian Mathematical Surveys*, 42(3) : 43-54, 1987.
- [2] William S Massey. *Homology and Cohomology Theory*, volume 46 of *Pure and applied mathematics*. New York & Basel : Dekker, 1978.
- [3] Dj.Khadjiev, Some Questions in the Theory of Vector Invariants, *Math. USSR- Sbornic*, 1(3), 383-396, 1967.
- [4] Grosshans F., Obsevable Groups and Hilbert's Problem, *American Journal of Math.*,95, 229-253, 1973.
- [5] H. Weyl, The Classical Groups, Their Invariants and Representations, 2nd ed., with suppl., Princeton, *Princeton University Press*, 1946.
- [6] Dj. Khadjiev , *An Application of the Invariant Theory to the Differential Geometry of Curves*, Fan, Tashkent, 1988. (in Russian)
- [7] F. Klein, A comperative review of recent researches in geometry (translated by Dr. M.W. Haskell), *Bulletin of the New York Mathematical Society*, 2,215-249, 1893.
- [8] G. Birkhoff, Hydrodynamics, second Ed. Princeton, New Jersey, *Princeton Univ. Pres*, 1960.
- [9] J.B.J. Fourier, Theoric Analytique de la Chaleur, 1822 (English Transl. By A. Freeman, The Analytical Theory of Heat, *Cambridge University Press*,1878).
- [10] P. W. Bridgman, Dimensional Analysis, 2 nd Ed. *Yale University Press*, New Heaven, 1931.
- [11] L.I.Sedov, Similarity and Dimensional Method in Mechanics, English Tr. By V.Kisin, *Mir Publishers*, USSR, 1982.
- [12] H.L. Langhaar , Dimensional Analysis and Theory of Models, *Wiley*, 1951.
- [13] M.Incesu, The Complete System of Point Invariants in the Similarity Geometry, Phd. Thesis, *Karadeniz Technical University*, Trabzon, 2008.
- [14] Marsh D., Applied Geometry for Computer Graphics and CAD, *Springer-Verlag London Berlin Heidelberg*, London, 1999.
- [15] Farin G.,Curves and Surfaces for Computer Aided Geometric Design A Practical Guide, 2nd edition, *Academic Press Inc.*, San Diego, 1990.
- [16] Farouki R. and Rajan V.T., On the numerical condition of polynomials in Bernstein form. *Computer Aided Geometric Design*, 4(3),191-216, 1987.