

# Povzetek

V diplomskem delu bom predstavil interpolacijo z geometrijsko zveznimi polinomskimi krivuljami. Najprej se bomo lotili interpolacije s kvadratnimi polinomi v ravnini. Z njo bomo interpolirali štiri podatke, kadar bo to mogoče. Pogoji za obstoj take interpolacijske krivulje bodo geometrijsko razumljivi. Red napake pa bo nepričakovan, 4. V naslednjem poglavju bomo obravnavali interpolacijo s kubičnimi polinomskimi krivuljami v prostoru in poskušali interpolirati pet točk. Tudi tu bomo poiskali pogoje za obstoj interpolacijske krivulje in izračunali asimptotični red napake. V nadaljevanju bomo s pomočjo Beziérovih krivulj podobno obravnavali še interpolacijo z odsekoma kvadratnimi  $G^2$ -zveznimi krivuljami v ravnini. Na koncu pa se bomo lotili še interpolacije z odsekoma kubičnimi  $G^2$ -zveznimi krivuljami v prostoru.

**Ključne besede:** Interpolacija, Beziérove krivulje,  $G^2$ -zveznost, Kvadratni in kubični polinomi, Red aproksimacije

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## Abstract

In this paper the geometric interpolation in  $\mathbb{R}^2$  and  $\mathbb{R}^3$  is studied. At the beginning a quadratic polynomial interpolation in plane will be used to interpolate four points when possible. Conditions for the existence will turn out to be purely geometric. The approximation order 4 will be achieved, unexpectedly. In the next chapter, the cubic polynomial interpolation in  $\mathbb{R}^3$  will be studied. Five data points will be interpolated under certain conditions, as well as the asymptotic approximation order determined. The discussion will be ended with quadratic  $G^2$ -continuous spline curves, and with cubic  $G^2$ -continuous spline curves.

**Key words:** Quadratic and Cubic polynomials, Geometric Interpolation, Beziér curves,  $G^2$  continuity, Approximation order

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