EUROPEAN INFORMATION TECHNOLOGIES CERTIFICATION INSTITUTE, ASBL.

Brussels, Belgium, European Union

CERTIFICATE

Artur Czeszewski

Has successfully completed test requirements of
The European Information Technologies Certification Programme

EITC/CG/TFCG Theoretical foundations of computer graphics

Certification Programme examination result: 100%

Certification Programme description:

Introduction: computer graphics (origins and history of computer graphics, applications, hardware), raster and vector graphics, interaction human-computer, graphics standards; Light and colour: basic concepts and definitions (colourimetry, perception), eye construction and properties of vision, theory of colour vision, colour models (CIE XYZ, CIE Lab, RGB, CMY and CMYK, HLS and HSV), colour reproduction, compatibility problems (raster distortion); Raster operations - basics: segment and arc drawing, polygon filling (seed fill, parity test), clipping algorithms, elements of computational geometry (alpha function, orientation on a plane, point-in-polygon problem); Geometric transformations in computer graphics: 2D transformations, matrix representation of transformations, normalized homogeneous coordinates, basic types of transformations (symmetric reflection, skew, scale, translate, rotate), 3D transformations, composition of transformations, problem of numerical accuracy, quaternions; 2D representation of a 3D space: projection on a plane (types of projection, projection properties, coordinate system), parallel and perspective projection as matrix operations, projection and view (viewing frustum, projection parameters, perspective transformation, projection and photography, virtual camera); Objects modelling for computer graphics: modelling of curves and surfaces (interpolation, parameterization, BÃ©zier curves, B-splines curves), solid modelling, fractal modelling, modelling using grammars, volumetric modelling; Hidden surface removal: determining surface visibility, classes and examples of algorithms; Lighting modelling: light scattering - interaction of light with matter, basic photometric quantities, light reflection models, shading; Global illumination; Ray tracing algorithms; Increasing the realism of processed images and objects: textures and their types (texture sampling and filtering problems), shape deformation, animation elements

Certificate Programme version/revision: EITC/CG/TFCGv1r2

CERTIFICATE ID: **EITC/CG/TFCG/JQF26005058**

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DATE OF ISSUE:
October 2026
Brussels, Belgium
European Union