

MODELOWANIE GEOMETRYCZNE

(Propozycje projektów zaliczeniowych)

1. Wymierne krzywe Béziera

- Farin, G.: Curves and Surfaces for CAGD – A Practical Guide. 5th Edition, Morgan Kaufmann Publishers, (2002)
- Kiciak, P.: Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej. wyd. 3, WNT, (2019)
- Salomon, D.: Curves and Surfaces for Computer Graphics. Springer, (2006)

2. Krzywe Q-Béziera

- Chen, J., Wang, G.-J.: A New Type of the Generalized Bézier Curves. Applied Mathematics – A Journal of Chinese Universities 26(1), 47–56, (2011)
- Han, X.-A., Ma, Y.C., Huang, X.L.: A Novel Generalization of Bézier Curve and Surface. Journal of Computational and Applied Mathematics 217(1), 180–193, (2008)

3. Krzywe B-sklejane (ang. B-spline)

- Kiciak, P.: Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej. wyd. 3, WNT, (2019)
- Marsh, D.: Applied Geometry for Computer Graphics and CAD. 2nd Edition, Springer-Verlag, (2005)
- Salomon, D.: Curves and Surfaces for Computer Graphics. Springer, (2006)

4. Krzywe NURBS

- Kiciak, P.: Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej. wyd. 3, WNT, (2019)
- Koprowski, P.: Glimpses of geometry and graphics.
<http://www.pkoprowski.eu/ggg/main.pdf>
- Rogers, D.F.: An Introduction to NURBS – With Historical Perspective. Morgan Kaufmann Publishers, (2001)

5. J-splines

- Rossignac, J., Schaefer, S.: J-splines. Computer Aided Design 40(10-11), 1024–1032, (2008)

6. Niestacjonarne schematy subdivision

- Daniel, S., Shunmugaraj, P.: Some Non-stationary Subdivision Schemes. Geometric Modeling and Imaging 2007, pp. 33–38, (2007)

7. Parametryzacja niejednorodnych, sklejanym krzywych Catmulla-Roma

- Yuksel, C., Schaefer, S., Keyser, J.: On the Parameterization of Catmull-Rom Curves. Proceedings of SIAM/ACM Joint Conference on Geometric and Physical Modeling 2009, pp. 41–53, (2009)

- Yuksel, C., Schaefer, S., Keyser, J.: Parameterization and Applications of Catmull-Rom Curves. *Computer-Aided Design* 43(7), 747–755, (2011)
8. **Krzywe Kochanka-Bartelsa**
- Eberly, D.: Kochanek-Bartels Cubic Splines (TCB Splines). (1999)
<http://www.geometrictools.com/Documentation/KBSplines.pdf>
 - Kochanek, D., Bartels, R.: Interpolating Splines with Local Tension, Continuity and Bias Control. *Computer Graphics* 18(3), 33–41, (1984)
 - Salomon, D.: *Curves and Surfaces for Computer Graphics*. Springer, (2006)
9. **Krzywe sklepane z wektorami kontrolnymi**
- Kosinka, J., Sabin, M.A., Dodgson, N.A.: Control Vectors for Splines. *Computer-Aided Design* 58, 173–178, (2015)
10. **Wymierne trygonometryczne krzywe Béziera z parametrami kształtu**
- Bashir, U., Ali, J.M.: Rational Cubic Trigonometric Bézier Curve with Two Shape Parameters. *Computational and Applied Mathematics* 35(1), 285–300, (2016)
11. **Powierzchnie rozwijalne (ang. Ruled Surfaces), powierzchnie ciągnione (ang. Sweep Surfaces)**
- Agoston, M.K.: *Computer Graphics and Geometric Modeling: Implementation nad Algorithms*. Springer-Verlag, (2005)
 - Salomon, D.: *Curves and Surfaces for Computer Graphics*. Springer, (2006)
12. **Powierzchnie Loopa**
- Loop, C.: Smooth Subdivision Surfaces Based on Triangles. Master's Thesis, University of Utah, Department of Mathematics, (1987)
 - Warren, J., Schaefer, S.: A Factored Approach to Subdivision Surfaces. *Computer Graphics & Applications* 24(3), 74–81, (2004)
 - Zorin, D., Schröder, P.: *Subdivision for Modeling and Animation*. SIGGRAPH 2000 Course Notes
13. **Wymierne płaty Béziera**
- Farin, G.: *Curves and Surfaces for CAGD – A Practical Guide*. 5th Edition, Morgan Kaufmann Publishers, (2002)
 - Kiciak, P.: *Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej*. wyd. 3, WNT, (2019)
14. **Deformacja swobodna (ang. Free-Form Deformation)**
- Hsu, W.M., Hughes, J.F., Kaufman, H.: Direct Manipulation of Free-Form Deformations. *Computer Graphics* 26(2), 177–184, (1992)
 - Kiciak, P.: *Podstawy modelowania krzywych i powierzchni: zastosowania w grafice komputerowej*. wyd. 3, WNT, (2019)

- Sederberg, T.W., Parry, S.R.: Free-Form Deformation of Solid Geometric Models. *Computer Graphics* 20(4), 151–160, (1986)
15. **Płaty Coonsa**
- Agoston, M.K.: *Computer Graphics and Geometric Modeling: Implementation nad Algorithms*. Springer-Verlag, (2005)
 - Salomon, D.: *Curves and Surfaces for Computer Graphics*. Springer, (2006)
16. **Trójkąty PN**
- Haines, E., Akenine-Möller, T.: Bézier Triangles and N-Patches. (2002)
<https://www.gamedeveloper.com/programming/b-zier-triangles-and-n-patches>
 - Schwarz, M., Stuginski, M., Stamminger, M.: GPU-based Rendering of PN Triangle Meshes with Adaptive Tessellation. *Proceedings of Vision, Modeling, and Visualization 2006*, pp. 161–168, (2006)
 - Vlachos, A., Peters, J., Boyd, C., Mitchell, J.L.: Curved PN Triangles. *Proceedings of the 2001 Symposium on Interactive 3D Graphics*, pp. 159–166, (2001)
17. **Aproksymacja powierzchni Catmulla-Clarka za pomocą płatów bikubicznych**
- Loop, C., Schaefer, S.: Approximating Catmull-Clark Subdivision Surfaces with Bicubic Patches. *ACM Transactions on Graphics* 27(1), 8:1–8:11, (2008)
18. **Krzywe generowane fraktalnie**
- Goldman, R.: The Fractal Nature of Bézier Curves. *Proceedings of Geometric Modeling and Processing: Theory and Applications*, pp. 3–11, (2004)
 - Kotarski, W.: *Fraktalne modelowanie kształtu*. EXIT, (2008)
 - Schaefer, S., Levin, D., Goldman, R.: Subdivision Schemes and Attractors. *Eurographics Symposium on Geometry Processing*, pp. 171–180, (2005)
19. **Płaty powierzchni generowane fraktalnie**
- Kotarski, W.: *Fraktalne modelowanie kształtu*. EXIT, (2008)
 - Schaefer, S., Levin, D., Goldman, R.: Subdivision Schemes and Attractors. *Eurographics Symposium on Geometry Processing*, pp. 171–180, (2005)
20. **L-systemy**
- Goldman, R., Schaefer, S., Ju, T.: Turtle Geometry in Computer Graphics and Computer-Aided Design. *Computer-Aided Design* 36(14), 1471–1482, (2004)
 - Peitgen, H.-O., Jürgens, H., Saupe, D.: *Granice chaosu. Fraktale*. Tom 2, PWN, (2002)
 - Prusinkiewicz, P., Lindenmayer, A.: *The Algorithmic Beauty of Plants*. Springer-Verlag, (2004)
21. **Trygonometryczne krzywe B-sklejane**
- Albrecht, G., Mainar, E., Pena, J.M., Rubio, B.: A New Class of Trigonometric B-Spline Curves. *Symmetry* 15(8), 1551, (2023)

22. **Uogólnione krzywe Béziera z parametrami kształtu**
- Hu, G., Wu, J., Qin, X.: A Novel Extension of the Bézier Model and its Applications to Surface Modeling. *Advances in Engineering Software* 125, 27–54, (2018)
23. **Uogólnione płaty Béziera z parametrami kształtu**
- Hu, G., Wu, J., Qin, X.: A Novel Extension of the Bézier Model and its Applications to Surface Modeling. *Advances in Engineering Software* 125, 27–54, (2018)
24. **Krzywe β -Béziera**
- Cheng, F., Kazadi, A.N., Lin, A.J.: Beta-Bézier Curves. *Computer-Aided Design and Applications* 18(6), 1265–1278, (2021)
25. **Trygonometryczne krzywe Béziera z parametrami kształtu**
- BiBi, S., Abbas, M., Miura, K.T., Misro, M.Y.: Geometric Modeling of Novel Generalized Hybrid Trigonometric Bézier-like Curve with Shape Parameters and its Applications. *Mathematics* 8(6), 967, (2020)
26. **Krzywe P-Béziera**
- Kovács, I., Várady, T.: P-Bézier and P-Bspline Curves – New Representation with Proximity Control. *Computer Aided Geometric Design* 62, 117–132, (2018)
27. **Płaty P-Béziera**
- Kovács, I., Várady, T.: P-Bézier and P-Bspline Curves – New Representation with Proximity Control. *Computer Aided Geometric Design* 62, 117–132, (2018)
28. **Wymierne, kubiczne, trygonometryczne krzywe Béziera**
- Bashir, U., Ali, J.M.: Rational Cubic Trigonometric Bézier Curve with Two Shape Parameters. *Computational and Applied Mathematics* 35(1), 285–300, (2016)
29. **Inne.** Można napisać inny program według własnego pomysłu, po uprzednim uzyskaniu akceptacji prowadzącego zajęcia.