

# Zgłoszenie tematu pracy dyplomowej :: **STUDIA II STOPNIA** ::

na rok akademicki 2024/25

<b>Promotor:</b>	<b>Dr Zdobysław Świerczyński</b>
Temat pracy magisterskiej (j. polski oraz j. angielski):	Porównanie wybranych metod numerycznych wyznaczania pierwiastków równań nieliniowych <i>A comparison of selected numerical root-finding methods for nonlinear equations</i>
Zakres i oczekiwane rezultaty pracy:	Napisanie programów, przeprowadzenie obliczeń (analitycznych oraz numerycznych) i porównanie wybranych metod numerycznych
*Aspekt naukowy, problemowy pracy:	Porównanie wybranych metod numerycznych
Literatura	<p>Advances in Iterative Methods for Nonlinear Equations SEMA SIMAI Springer Series Volume 10 Springer International Publishing Switzerland 2016 Sergio Amat, Sonia Busquier Editors</p> <p>Alicia Cordero, Neus Garrido, Juan R. Torregrosa, Paula Triguero-Navarro Iterative schemes for finding all roots simultaneously of nonlinear equations Applied Mathematics Letters 134 (2022) 108325</p> <p>Pairat Janngama, Chalermwut Comemuang New twelfth order iterative method for solving nonlinear equations and their dynamical aspects J. Math. Computer Sci., 28 (2023), 52–59</p> <p>Mohammed RASHEED, Suha SHIHAB, Ahmed Rashid, Taha Rashid, Saad Hussein Abed Hamad, Farazdack Fawzi Hamed Alshebeeb Multistep Iterative Algorithms for Solving Nonlinear Equation Journal of Al-Qadisiyah for Computer Science and Mathematics Vol. 13(2) 2021 , pp Math . 123–132</p> <p>G Thangkhenpau and Sunil Panday Optimal Eight Order Derivative-Free Family of Iterative Methods for Solving Nonlinear Equations IAENG International Journal of Computer Science, Volume 50, (2023)</p> <p>Navya Kakarlapudi, Mani Sandeep Kumar Mylapalli, Pravin Singh Basins of Attraction of an Optimal Iterative Scheme for Solving Nonlinear Equations and Their Applications IAENG International Journal of Computer Science Volume 51, (2024), Pages 55-66</p> <p>B. Neta BASIN ATTRACTORS FOR DERIVATIVE-FREE METHODS TO FIND SIMPLE ROOTS OF NONLINEAR EQUATIONS J. Numer. Anal. Approx. Theory, vol. 49 (2020) no. 2, pp. 177–189</p>

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<p>Christian Beleña Postigo Ostrowski's Method for Solving Nonlinear Equations and Systems Journal of Mechanics Engineering and Automation 13 (2023) 1-6</p> <p>M. Barrada, R. Benkhouya, Ch. Ziti and A. Rhattoy New Family of Chebyshev's Method for Finding Simple Roots of Nonlinear Equations Engineering Letters, (2020) 28:4, EL_28_4_35</p> <p>Harmandeep Singh and Janak Raj Sharma Simple and Efficient Fifth Order Solvers for Systems of Nonlinear Problems Mathematical Modelling and Analysis Volume 28, Issue 1, 1–22, 2023</p> <p>Amir Naseem, M. A. Rehman and Thabet Abdeljawad Numerical Algorithms for Finding Zeros of Nonlinear Equations and Their Dynamical Aspects Volume 2020, Article ID 2816843</p> <p>O. Ogbereyivwea, S. S. Umarb, O. Izevbizua Some High-Order Convergence Modifications of the Householder Method for Nonlinear Equations Commun. Nonlinear Anal. 2 (2023), 1–11</p> <p>B. Neta A New Derivative-Free Method to Solve Nonlinear Equations Mathematics 2021, 9, 583.</p> <p>Thangkhenpau, G.; Panday,S.; Mittal, S.K.; Jäntschi, L. Novel Parametric Families of with and without Memory Iterative Methods for Multiple Roots of Nonlinear Equations. Mathematics 2023, 11, 2036.</p> <p>Buddhi Prasad Sapkota<sup>1</sup>, Jivandhar Jnawali EUROPEAN JOURNAL OF PURE AND APPLIED MATHEMATICS Vol. 16, No. 4, 2023, 2419-2430</p> <p>Parimala Sivakumar<sup>†</sup>, Kalyanasundaram Madhu<sup>‡</sup>, Jayakumar Jayaraman Optimal Eighth And Sixteenth Order Iterative Methods For Solving Nonlinear Equation With Basins Of Attraction Applied Mathematics E-Notes, 21(2021), 320-343</p> <p>Ekta Sharma<sup>1</sup>, Sunil Panday and Mona Dwived New Optimal Fourth Order Iterative Method for Solving Nonlinear Equations International Journal on Emerging Technologies 11(3): 755-758(2020)</p> <p>Changbum Chun, Beny Neta How good are methods with memory for the solution of nonlinear equations? SeMA (2017) 74:613–625</p>
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	<p>Khalid Jamali, Muhammad Anwar Solangi, Sania Qureshi A NOVEL HYBRID ITERATIVE METHOD FOR APPLIED MATHEMATICAL MODELS WITH TIME-EFFICIENCY Journal of Applied Mathematics and Computational Mechanics 2022, 21(3), 19-29</p> <p>O. Ogbereyivwe, J. O. Emunefe An optimal family of methods for obtaining the zero of nonlinear equation Vol 3(1), 2022, pp:17-24</p> <p>S. Abbasbandy a, Y. Tan, S.J. Liao Newton-homotopy analysis method for nonlinear equations Applied Mathematics and Computation 188 (2007) 1794–1800</p> <p>Candelario, G.; Cordero, A.;Torregrosa, J.R.; Vassileva, M.P. Derivative-Free Conformable Iterative Methods for Solving Nonlinear Equations. Fractal Fract. 2023, 7, 578</p> <p>Alatuhigha Nguni, Chacha S. Chacha and Adeline P. Mtunya An Efficient Derivative Free Iterative Method and Condition Number of Nonlinear Equations Arising from Real World Phenomena Tanzania Journal of Science 49(3): 597-604, 2023</p> <p>Vali Torkashvand Improving the convergence order of Steffensen’s method from two to four and its dynamic CJMS. 12(2)(2023), 303-322</p> <p>Oghovese Ogbereyivwe and Veronica Ojo-Orobosa High Order Quadrature Based Iterative Method for Approximating the Solution of Nonlinear Equations CJMS. 9 (2)(2020), 243-255</p> <p>V. Torkashvand, M. A. Fariborzi Araghi Construction of Iterative Adaptive Methods with Memory with 100% Improvement of Convergence Order Journal of Mathematical Extension Vol. 15, No. 3, (2021) (16)1-32</p> <p>Awais Gul Khan, Farah Ameen, Muhammad Uzair Awan and Kamsing Nonlaopon Some new numerical schemes for finding the solutions to nonlinear equations AIMS Mathematics, 7(10): 18616–18631</p> <p>Mohammed RASHEED, Suha SHIHAB, Taha RASHID, Yaseen Hadi Ali Predictor-Corrector Solutions for Nonlinear Equations Journal of Al-Qadisiyah for Computer Science and Mathematics Vol. 13(1) 2021 , pp Math. 210–218</p>
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	<p>Eighth order family of iterative methods for nonlinear equations and their basins of attraction Journal of Computational and Applied Mathematics 343 (2018) 458–480 Djordje Herceg, Dragoslav Herceg</p> <p>Nurul Nabilah Rosli<sup>1</sup>, Nor Azni Shahari, Farah Atikah Mohamad Azraei, Siti Najwa Izaham COMPARATIVE STUDY OF NONLINEAR ROOT FINDING USING IMPROVISED SECANT METHODS Malaysian Journal of Computing, 8 (1): 1349-1362, 2023</p> <p>Muhammad Aslam Noor, Khalida Inayat Noor, Waseem Asghar Khan, Faizan Ahmad On iterative methods for nonlinear equations Applied Mathematics and Computation 183 (2006) 128–133</p> <p>Ankush Aggarwal, and Sanjay Pant Beyond Newton: A New Root-Finding Fixed-Point Iteration for Nonlinear Equations algorithms</p>
**Oprogramowanie, język programowania, środowisko systemowe:	C, C++
**Środowisko uruchomieniowe:	
Dodatkowe wymagania i uwagi:	Dobra znajomość matematyki

**UWAGA:**

W polu literatura należy wskazać minimum 1 publikację z listy czasopism punktowanych wg wykazu MNiSW z dnia 5 stycznia 2024 r. związaną z proponowanym tematem pracy dyplomowej.

\* Regulamin studiów § 36 2. Praca dyplomowa na profilu praktycznym, podobnie jak praca inżynierska, powinna mieć charakter aplikacyjny, badawczy, projektowy lub oceniający praktykę w świetle teorii.

\*\* pola opcjonalne