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RESEARCH INTERESTS

Autonomic Computing, Decision Support, Computing Education

EDUCATION

Ph.D. Computer Science, Nova Southeastern University, 2013.
Dissertation: Code Clone Discovery Based on Concolic Analysis

M.S. Software Design & Management, Rochester Institute of Technology, 2007.

B.S. Computer Science & History (Military History Specialization), St. John Fisher College, 2004.

EMPLOYMENT

Assistant Professor, Department of Software Engineering, RIT 2017–Present.

Lecturer, Department of Software Engineering, RIT 2010–2017.

APPOINTMENTS

Research Fellow, US Air Force Office of Scientific Research (AFRL/RI), 2018

RESEARCH GRANTS

[PI: $1.2M; Co-PI: $1.7M in federal funding]

G1: NSF, "Intervention-Based Experiential Education Labs", $749,926 ($671,070 RIT + $78,856 Bethune-Cookman University) (PI: **Daniel Krutz**; Co-PI: Samuel Malachowsky; 9/21 - 9/24).

G2: NSA, "GenCyber @ RIT: Secure Computing", $60,184 (PI: **Daniel Krutz**; Co-PI: Stacey Watson, Sumita Mishra; 4/20 - 3/22).

G3: NSA, "GenCyber @ RIT: Secure Computing", $106,023 (PI: **Daniel Krutz**; Co-PI: Stacey Watson, Jayalaxmi Charavarthy, Robert St. Jacques; 4/19 - 4/20).

G4: AFRL, "Uncertainty Reduction in Self-Adaptive Systems to Increase System Effectiveness, Efficiency and Resiliency", "Extension Grant" (PI: **Daniel Krutz**; 4/19 - 12/19).

G5: ONR, "A Multimodal Dynamic Bayesian Learning Framework for Complex Decision-making", $1,586,800 (PI: Qi Yu; Co-PI: **Daniel Krutz**; 10/18 - 9/22).

G6: NSF, "Developing Experiential Laboratories for Computing Accessibility Education", $299,994 (PI: **Daniel Krutz**; Co-PI: Samuel Malachowsky, Paul Tymann, Yasmine El-Glaly; 9/18 - 8/21).

G7: NSF, "Collaborative Research: Interactive Video-Enhanced Tutorials on Problem Solving in Physics", $290,105 (PI: Robert Teese; Co-PI: Michelle Chabot; Sr. Person **Daniel Krutz**; 9/18 - 8/21).

G8: NSA, "GenCyber @ RIT: Secure Web and Mobile Computing", $130,908 (PI: Rajendra Raj; Co-PI: **Daniel Krutz**; 5/18 - 4/19).

G9: RIT, "Making Self-Adaptive Systems More Resilient By Reducing Decision-Making Uncertainty"', $5,000 (PI: **Daniel Krutz**; Co-PI: None; 5/18 - 9/18).

G10: SIGSCE, "Inclusive Apps: Supporting Mobile Accessibility Standards Through Educational Exercises", $3,800 (PI: **Daniel Krutz**; Co-PI: Yasmine El-Glaly; 1/17 - 12/17).

G11: RIT, "FEED Development ", $3,150 (PI: **Daniel Krutz**; Co-PI: None; 1/17 - 12/17).

G12: RIT, "PLASMA: A Set of Educational Mobile Security Modules", $1,800 (PI: **Daniel Krutz**; Co-PI: None; 1/16 - 12/16).

G13: RIT, "FEED Development ", $3,150 (PI: **Daniel Krutz**; Co-PI: None; 1/16 - 12/16).

G14: SIGSCE, "Supporting Education Using a Public Oracle of Vulnerable Mobile Apps", $2,400 (PI: **Daniel Krutz**; Co-PI: None; 1/16 - 12/16).

G15: RIT, "Investigating Android M Permissions: Adoption, Ratings, and Malware", $1,800 (PI: **Daniel Krutz**; Co-PI: None; 1/15 - 12/15).

G16: RIT, "Enhancing Software Engineering Education for Deaf/HoH Students", $525 (PI: **Daniel Krutz**; Co-PI: None; 1/15 - 12/15).

GIFTS

G17: Visions Global Empowerment, "Women in Computing Hackathon", $2,750 (PI: **Daniel Krutz**; Co-PI: None; 11/20).

PUBLICATIONS

[1] ElSaid, AbdElRahman ; Karns, Joshua ; Lyu, Zimeng ; Krutz, Daniel ; Ororbia, Alexander ; Desell, Travis: Improving Neuroevolutionary Transfer Learning of Deep Recurrent Neural Networks through Network-Aware Adaptation. In: *Proceedings of the 2020 Genetic and Evolutionary Computation Conference*. New York, NY, USA : Association for Computing Machinery, 2020 (GECCO 20). – ISBN 9781450371285, 315323. – Best paper nominee

[2] ElSaid, AbdElRahman ; Karns, Joshua ; au2, Alexander Ororbia I. ; Krutz, Daniel ; Lyu, Zimeng ; Desell, Travis: *Neuroevolutionary Transfer Learning of Deep Recurrent Neural Networks through Network-Aware Adaptation*. 2020

[3] Shi, Weishi ; Malachowsky, Samuel ; El-Glaly, Yasmine ; Yu, Qi ; Krutz, Daniel E.: Presenting and Evaluating the Impact of Experiential Learning in Computing Accessibility Education. In: *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering: Software Engineering Education and Training*. New York, NY, USA : Association for Computing Machinery, 2020 (ICSE-SEET '20). – ISBN 9781450371247, 4960. – Distinguished Paper Award

[4] Shi, Weishi ; Khan, Saad ; El-Glaly, Yasmine ; Malachowsky, Samuel ; Yu, Qi ; Krutz, Daniel E.: Experiential Learning in Computing Accessibility Education. In: *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering: Companion Proceedings*. New York, NY, USA : Association for Computing Machinery, 2020 (ICSE '20). – ISBN 9781450371223, 250251

[5] ElSaid, AbdElRahman ; Karnas, Joshua ; Lyu, Zimeng ; Krutz, Daniel ; Ororbia, Alexander G. ; Desell, Travis: Neuro-Evolutionary Transfer Learning Through Structural Adaptation. In: *International Conference on the Applications of Evolutionary Computation (Part of EvoStar)* Springer, 2020, S. 610–625

[6] Palmerino, J. ; Yu, Q. ; Desell, T. ; Krutz, D.: Improving the Decision-Making Process of Self-Adaptive Systems by Accounting for Tactic Volatility. In: *2019 34th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, 2019. – ISSN 1938–4300, S. 949–961

[7] Scoccia, Gian L. ; Peruma, Anthony ; Pujols, Virginia ; Malavolta, Ivano ; Krutz, Daniel E.: Permission Issues in Open-Source Android Apps: An Exploratory Study. In: *2019 19th International Working Conference on Source Code Analysis and Manipulation (SCAM)* IEEE, S. 238–249

[8] ElSaid, A. ; Desell, T. ; Krutz, D.: Is Adaptivity a Core Property of Intelligent Systems? It Depends. In: *2019 IEEE/ACM 14th International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*, 2019

[9] Scoccia, Gian L. ; Peruma, Anthony ; Pujols, Virginia ; Christians, Ben ; Krutz, Daniel E.: An Empirical History of Permission Requests and Mistakes in Open Source Android Apps. In: *Proceedings of the 16th International Conference on Mining Software Repositories*, 2019 (MSR '19)

[10] Peruma, Anthony ; Krutz, Daniel: Security: a critical quality attribute in self-adaptive systems. In: *2018 IEEE/ACM 13th International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)* IEEE, 2018

[11] Peruma, Anthony ; Palmerino, Jeffrey ; Krutz, Daniel E.: Investigating user perception and comprehension of android permission models. In: *Proceedings of the 5th International Conference on Mobile Software Engineering and Systems* ACM, 2018, S. 56–66

[12] Peruma, Anthony ; Krutz, Daniel E.: Understanding the Relationship Between Quality and Security: A Large-Scale Analysis of Android Applications. In: *International Workshop on Security Awareness from Design to Deployment*. New York, NY, USA : ACM, 2018 (SEAD 2018)

[13] Peruma, Anthony ; Malachowsky, Samuel A. ; Krutz, Daniel E.: Providing an Experiential Cybersecurity Learning Experience Through Mobile Security Labs. In: *International Workshop on Security Awareness from Design to Deployment*. New York, NY, USA : ACM, 2018 (SEAD 2018)

[14] El-Glaly, Yasmine N. ; Peruma, Anthony ; Krutz, Daniel E. ; Hawker, J. S.: Apps for Everyone: Mobile Accessibility Learning Modules. In: *ACM Inroads* 9 (2018), April, Nr. 2, 30–33. http://dx.doi.org/10.1145/3182184. – DOI 10.1145/3182184. – ISSN 2153–2184

[15] Krutz, Daniel E. ; Richards, Thomas: Cyber Security Education: Why Don't We Do Anything About It? In: *ACM Inroads* 8 (2017), Oktober, Nr. 4, 5–5. http://dx.doi.org/10.1145/3132217. – DOI 10.1145/3132217. – ISSN 2153–2184

[16] Krutz, Daniel E. ; Munaiah, Nuthan ; Peruma, Anthony ; Mkaouer, Mohamed W.: Who Added That Permission to My App?: An Analysis of Developer Permission Changes in Open Source Android Apps. In: *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems*. Piscataway, NJ, USA : IEEE Press, 2017 (MOBILESoft '17). – ISBN 978–1–5386–2669–6, 165–169

[17] McAfee, Patrick ; Mkaouer, Mohamed W. ; Krutz, Daniel E.: CATE: Concolic Android Testing Using Java Pathfinder for Android Applications. In: *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems*. Piscataway, NJ, USA : IEEE Press, 2017 (MOBILESoft '17). – ISBN 978–1–5386–2669–6, 213–214

[18] Chester, Piper ; Jones, Chris ; Mkaouer, Mohamed W. ; Krutz, Daniel E.: M-perm: A Lightweight Detector for Android Permission Gaps. In: *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems*. Piscataway, NJ, USA : IEEE Press, 2017 (MOBILESoft '17). – ISBN 978–1–5386–2669–6, 217–218

[19] Dennis, Colton ; Krutz, Daniel E. ; Mkaouer, Mohamed W.: P-lint: A Permission Smell Detector for Android Applications. In: *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems*. Piscataway, NJ, USA : IEEE Press, 2017 (MOBILESoft '17). – ISBN 978–1–5386–2669–6, 219–220

[20] Krutz, Daniel E. ; Malachowsky, Samuel A.: Teaching android security through examples: a publicly available database of vulnerable apps. In: *ACM Inroads* 7 (2016), Nr. 4, S. 96–98

[21] Conference Organization. In: *2016 International Conference on Cloud and Autonomic Computing (ICCAC)*, 2016, S. ix–xi

[22] Krutz, Daniel E. ; Munaiah, Nuthan ; Meneely, Andrew ; Malachowsky, Samuel A.: Examining the Relationship Between Security Metrics and User Ratings of Mobile Apps: A Case Study. In: *Proceedings of the International Workshop on App Market Analytics*. New York, NY, USA : ACM, 2016 (WAMA 2016). – ISBN 978–1–4503–4398–5, 8–14

[23] Krutz, Daniel E. ; Mirakhorl, Mehdi: Architectural Clones: Toward Tactical Code Reuse. In: *Proceedings of the 31st Annual ACM Symposium on Applied Computing*. New York, NY, USA : ACM, 2016 (SAC '16). – ISBN 978–1–4503–3739–7, 1480–1485

[24] Munaiah, Nuthan ; Klimkowsky, Casey ; McRae, Shannon ; Blaine, Adam ; Malachowsky, Samuel A. ; Perez, Cesar ; Krutz, Daniel E.: Darwin: a static analysis dataset of malicious and benign Android apps. In: *Proceedings of the International Workshop on App Market Analytics* ACM, 2016, S. 26–29

[25] Malachowsky, S. A. ; Krutz, D. E.: A project component in a web engineering course. In: *2015 IEEE Frontiers in Education Conference (FIE)*, 2015, S. 1–6

[26] Krutz, D. E. ; Meneely, A. ; Malachowsky, S. A.: An insider threat activity in a software security course. In: *2015 IEEE Frontiers in Education Conference (FIE)*, 2015, S. 1–6

[27] Krutz, Daniel E. ; Mirakhorli, Mehdi ; Malachowsky, Samuel A. ; Ruiz, Andres ; Peterson, Jacob ; Filipski, Andrew ; Smith, Jared: A dataset of open-source Android applications. In: *Mining Software Repositories (MSR), 2015 IEEE/ACM 12th Working Conference on Mining Software Repositories* IEEE, 2015, S. 522–525

[28] Krutz, Daniel E. ; Malachowsky, Samuel A. ; Shihab, Emad: Examining the effectiveness of using concolic analysis to detect code clones. In: *Proceedings of the 30th Annual ACM Symposium on Applied Computing* ACM, 2015, S. 1610–1615

[29] Krutz, D. E. ; Malachowsky, S. A. ; Jones, S. D. ; Kaplan, J. A.: Enhancing the educational experience for deaf and hard of hearing students in software engineering. In: *2015 IEEE Frontiers in Education Conference (FIE)*, 2015, S. 1–9

[30] Krutz, Daniel E. ; Le, Wei: A code clone oracle. In: *Proceedings of the 11th Working Conference on Mining Software Repositories* ACM, 2014, S. 388–391

[31] Krutz, Daniel E. ; Malachowsky, Samuel A. ; Reichlmayr, Thomas: Using a Real World Project in a Software Testing Course. In: *Proceedings of the 45th ACM Technical Symposium on Computer Science Education*. New York, NY, USA : ACM, 2014 (SIGCSE '14). – ISBN 978–1–4503–2605–6, 49–54

[32] Krutz, Daniel E. ; Shihab, Emad: CCCD: Concolic code clone detection. In: *Reverse Engineering (WCRE), 2013 20th Working Conference on* IEEE, 2013, S. 489–490

[33] Krutz, D. E. ; Meneely, A.: Teaching Web Engineering using a project component. In: *2013 IEEE Frontiers in Education Conference (FIE)*, 2013. – ISSN 0190–5848, S. 1366–1368

[34] Krutz, D. E. ; Vallino, J. R.: Experiencing disruptive behavior in a team using moles. In: *2013 IEEE Frontiers in Education Conference (FIE)*, 2013. – ISSN 0190–5848, S. 1492–1495

[35] Krutz, D. E. ; Lutz, M.: Bug of the Day: Reinforcing the importance of testing. In: *2013 IEEE Frontiers in Education Conference (FIE)*, 2013. – ISSN 0190–5848, S. 1795–1799

[36] Krutz, Daniel E.: *Code Clone Discovery Based on Concolic Analysis*, Diss., 2013. – 139 S.

[37] Lutz, M. J. ; Vallino, J. R. ; Martnez, K. ; Krutz, D. E.: Instilling a software engineering mindset through freshman Seminar. In: *2012 Frontiers in Education Conference Proceedings*, 2012. – ISSN 0190–5848, S. 1–6

WORKSHOPS, TUTORIALS AND OTHER PRESENTATIONS

P1: *Tutorial*, "ALL: Accessibility Learning Labs for Computing Accessibility Education" (ITISCE) Remote, (COVID), - July, 2021
P2: *Tutorial*, "Supporting Computing Accessibility Education Using Experiential Learning Labs" (CCSCNE) Remote, (COVID), - April, 2021
P3: *Tutorial*, "Using Experiential Learning to Support Accessibility in Computing Education" (CSEE&T) Remote, (COVID), - October, 2020
P4: *Tutorial*, "Creating Accessible Software Using Experiential Learning Labs" (ASE) Remote, (COVID), - September, 2020
P5: *Panel*, "What and How to Teach Accessibility" (SIGSCE) Remote, (COVID), - June, 2020
P6: *Presentation*, "Accessibility Learning Labs" (CCSCNE) New Haven, Connecticut, USA - April, 2019
P7: *Invited Talk*, "Mobile Security Education" (n/a) Technische Universität Berlin, Berlin, Germany - July, 2017
P8: *Presentation*, "PLASMA: Educational Mobile Security Labs" (SEED Workshop) Syracuse, New York, USA - June, 2017
P9: *Presentation*, "Experiential Cybersecurity Educational Labs" (NYCWiC) Rochester, New York, USA - April, 2017

SERVICE

Advisory Boards

S1: U.S. Department of Defense: Algorithmic Warfare Cross Functional Team (AWCFT) Academic Innovation Council (Project Maven). 2019 - present

Grant Reviewer

S2: National Science Foundation (NSF) panelist: 2019, 2020, 2021
S3: Maryland Industrial Partnerships Program (MIPS): 2020

Program Committees

S4: International Conference on Model Driven Engineering Languages and Systems -SRC (MODELS). 2021 - Present
S5: International Symposium on Cluster, Cloud and Internet Computing (CCGrid). 2019 - Present
S6: Consortium for Computing Sciences in Colleges (CCSCNE). 2019 - Present
S7: Special Interest Group on Computer Science Education (SIGCSE). 2019 - Present
S8: Innovation & Technology in Computer Science Education (ITiCSE). 2018 - Present

Conference Organizing Committees

S9: International Conference on Cloud and Autonomic Computing (ICCAC). Poster Chair. 2017
S10: International Conference on Cloud and Autonomic Computing (ICCAC). Web Chair. 2016

Publication Reviewer

S11: Empirical Software Engineering (EMSE)
S12: Journal of Systems and Software (JSS)
S13: IEEE Software
S14: Journal of Network and Computer Applications (JNCA)
S15: Computers & Security
S16: Journal of Visual Language & Computing
S17: International Conference on University Learning and Teaching (InCULT)
S18: Frontiers in Education (FIE)
S19: American Society for Engineering Education (ASEE)

UNIVERSITY SERVICE

S20: College Academic Senate (Also University Council Representative) 2019 - Present
S21: GCCIS College Governance Committee 2016-Present (Chair 2017 - Present)
S22: University Nominations Committee (2020 - present)
S23: Coordinator for concurrent sections of Introduction to Software Engineering course (12-15 sections with 240-300 students) (2010-2016)
S24: Software Engineering undergraduate curriculum committee, 2012-2016
S25: Software Engineering honors advocate 2015-2017

PhD Students

Committee Member

- AbdElRahman A. ElSaid *"Nature Inspired Topology Optimization Of Recurrent Neural Networks"*

SUPERVISED MASTERS THESES

- Saad Khan – MS 7/21 "Pedagogical Evaluation of Cognitive Accessibility Learning Lab in the Classroom" *RIT*
- Jan Guillermo – MS 7/19 "Accessibility Lab: Audio Cues" *RIT*
- Jeff Palmerino – MS 5/19 "TVA: A Requirements Driven, Machine-Learning Approach for Addressing Tactic Volatility in Self-Adaptive Systems" *RIT*
- Saleh Rebaz – MS 11/17 "Mining User Reviews To Extract Features For Initial Release Of Mobile Apps" *RIT*
- Jhaveri Sweta – MS 8/17 "An Empirical Analysis of Privacy Leaks in Android Apps" *RIT*
- Tilekar Rohan – MS 8/17 "Extraction and Quality Analysis of Third Party Libraries in Android" *RIT*

COURSES TAUGHT

C1: Research Methods (graduate course)
C2: Web Engineering
C3: Engineering of Secure Software
C4: Foundations of Software Engineering (graduate course)
C5: Introduction to Software Engineering
C6: Software Testing
C7: Freshman Seminar
C8: Senior Project Coaching
C9: Engineering of Enterprise Software Systems
C10: Independent Study

INDUSTRY EXPERIENCE

- Technology Consultant, Mindex Technologies 8/2009 – 8/2010.
- Sr. Software Engineer, 5Linx Enterprises, 2/2009–8/2009.
- R&D Software Developer, Xerox Corporation 5/2004–1/2009.

PROFESSIONAL ASSOCIATIONS

- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Access Computing

REFERENCES

Available upon request

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