DOCTORAL SCHOOL OF INFORMATICS
COMPLEX EXAM SUBJECT

Programming methodology (main subject)

Everyday algorithms for introducing programming, programming models

Algorithms without a computer

Programming theorems, their role in programming education

Composition of programming theorems, composition techniques

Program transformations

Reduction of programming theorems to the summation programming theorem

Generalizations of programming theorems

Recursion in solving programming tasks

Problem-solving strategies

The programmer's thinking toolkit: language abstraction, analogy, algorithmic abstraction, decomposition, superposition, information conversion, intuition, variation

Efficiency of algorithms

References:

1. Berthold Vöcking; Helmut Alt; Martin Dietzfelbinger; Rüdiger Reischuk; Christian Scheideler; Heribert Vollmer; Dorothea Wagner (Editors): Algorithms Unplugged. Springer 2011, e-ISBN 978-3-642-15328-0
2. Gregorics, T., Sike S.: Generic algorithm patterns. Proceedings of Formal Methods in Computer Science Education (2008)
3. Gregorics, T.: Abstract levels of programming theorems. ACTA UNIVERSITATIS SAPIENTIAE INFORMATICA 4 : 2 pp. 247–259. (2012)
4. Szlávi Péter; Zsakó László: The Cognitive Toolkit of Programming – Algorithmic Abstraction, Decomposition-Superposition. ACTA DIDACTICA NAPOCENSIA (ISSN: 2065-1430) 10: (4) pp. 33-40. (2017)
5. Szlávi Péter; Törley Gábor; Zsakó László: Cognitive Operations in Use. In: Kovásznai Gergely; Terdik György (szerk.) ICAI 2017: 10th International Conference on Applied Informatics (http://icai.uni-eszterhazy.hu/abstracts).
6. Szlávi Péter; Törley Gábor; Zsakó László: The thinking toolkit of programming. In: Veronika Stoffová; Zsakó László; Szlávi Péter (szerk.): New methods and technologies in education and practice: Proceedinhs of XXIX. DIDMATTECH 2016.
7. Zsakó László; Szlávi Péter; Pap Gáborné Harangozó Éva: Joining Programming Theorems, a Practical Approach to Program Building. ANNALES UNIVERSITATIS

SCIENTIARUM BUDAPESTINENSIS DE ROLANDO EOTVOS NOMINATAE SECTIO COMPUTATORICA (ISSN: 0138-9491) 17: (1) pp. 155-172. (1998)

8. SZLÁVI Péter, TÖRLEY Gábor, ZSAKÓ László: Programming Theorems Have the Same Origin. Central-European Journal of New Technologies in Research, Education and PracticeVolume 1, Number 1, 2019. https://doi.org/10.36427/CEJNTREP.1.1.380
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10. Erdősné Németh Ágnes; Zsakó László: The place of the greedy method concept in the progression of contestants' thinkingIn: Veronika Stoffová; Zsakó László; Szlávi Péter (szerk.): New methods and technologies in education and practice: Proceedinhs of XXIX. DIDMATTECH 2016. pp. 105-110.
11. Erdősné Németh Ágnes; Zsakó László: Online training and contests for informatics contestants of secondary school age. EDUKACJA TECHNIKA INFORMATYKA (ISSN: 2080-9069) (eISSN: 2450-9221) 11: (1) pp. 273-280. (2015)