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25 February 2016

UCT research aims to make Java programming easier on mobile phones

New computer science research at the University of Cape Town aims to help students to learn computer programming using their mobile phones.

This could potentially be of great help to students in poorer countries, many of whom own a cellphone but don't have access to desktops and laptops.

Chao Mbogo's doctoral thesis, "Scaffolding java programming on a mobile phone for novice learners", proposes that programming environments on mobile phones could include a supporting technique called scaffolding which is specifically designed for mobile phones, based on the needs of learners. It addresses the limitations of mobile phones, such as small screens and small keypads, in their use as typical programming environments.

Such a scaffolded mobile programming environment would be particularly useful for novice learners of programming in resource-constrained environments.

"My experience while teaching first-year learners of programming at a Kenyan university revealed that the learners struggled in the subject mostly because they did not get enough practice. Most of the learners did not own PCs or laptops at home but they owned personal mobile phones that they always carried with them," said Mbogo.

She said the solution could be to use cellphones that the learners already have and design applications that consider their limitations, as well as taking into account the needs of learners.

"The study has shown that this is possible. The study has also shown that it is possible to support learners to learn computer programming using their mobile phones."

Mbogo used a six-level theoretic framework to design scaffolding techniques to support construction of Java programs on a mobile phone. The resulting prototype was tested with learners of programming in universities in Kenya and South Africa. The results of the

experiments indicated which scaffolding techniques could support the construction of Java programs on a mobile phone. Further, the results indicated the effectiveness of using these scaffolding techniques to construct Java programs on a mobile phone.

Mbogo has a BSc in Mathematics and Computer Science from Kenya Methodist University and an MSc in Computer Science from the University of Oxford. Her doctoral thesis was motivated from her experiences while teaching learners of programming at the Department of Computer Science at Kenya Methodist University. She will receive her PhD degree in computer science from UCT on 19 December 2015. Her research was supervised by Professor Edwin Blake and Associate Professor Hussein Suleman in the Department of Computer Science at UCT.

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Issued by: UCT Communication and Marketing Department

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