

# Rogo: An optimisation problem's solution returned to a mobile device using cloud-computing and SOA

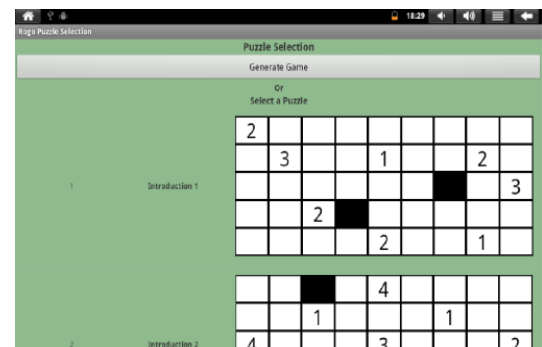
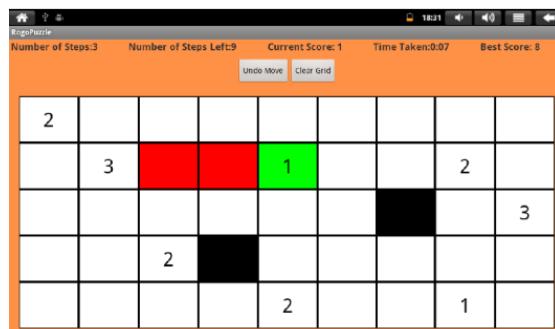
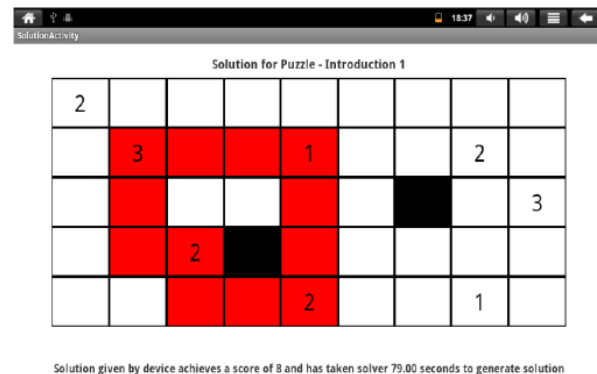
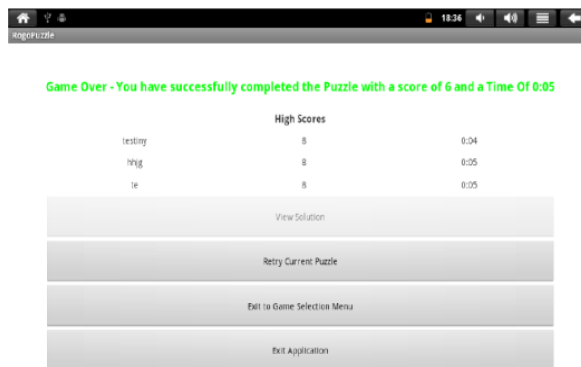
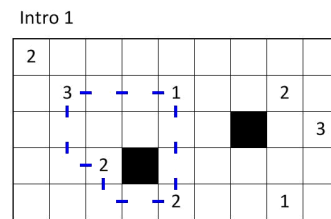
## Who Founded Rogo?

Rogo is a puzzle that was created by two academic members of the University of Canterbury in Christchurch, New Zealand and eventually formed the company Creative Heuristics Ltd. Further details on how Rogo was founded, as well as some paper-based daily puzzles, are available at <http://www.rogopuzzle.co.nz/>.

## Technologies Involved

- Windows Communication Foundation (WCF) Server utilising Cloud-Computing and Service Oriented Architecture (SOA)
- Android Application (Rogo Puzzle):
  - Android SDK
  - Android NDK(Native Development Kit)
  - LP Solve Library
  - SQL Lite Database
  -

## Rogo Puzzle Example and Solution



## Findings of Research

Overall it was discovered that on average the remote server was generating solutions around 25-30 times quicker than the mobile computing device. Also Rogo puzzles were deemed to be difficult, in particular depending on aspects such as reward square density, grid size and density of forbidden square density. In the case of Rogo introductory puzzle 7, it took the remote server around 3 and half hours to locate the optimal feasible solution.

### PURPOSE

The purpose of this dissertation was to investigate and discuss the usability and effectiveness of utilising existing modern technologies such as cloud-computing and SOA in delivering solutions to a Rogo puzzle on a mobile computing device. As such this project was a research based one.

### WHAT IS ROGO?

A Rogo puzzle is not that dissimilar to the well-known puzzle of Sudoku. The objective of a Rogo puzzle is to collect the biggest score possible using a supplied number of steps to create a loop within a specified grid.

In creating a solution for the puzzle the only movements that are valid are ones in horizontal and vertical direction. In addition there are forbidden squares within a Rogo puzzle which cannot be reached or used.

### MAIN FEATURES

- User able to attempt to solve Rogo puzzles
- Generation of Rogo puzzles
- Generation and Display of Solutions produced by Remote Server or Device
- High Scores
- Instructions on solving Rogo Puzzles
- Ability to Modify Settings