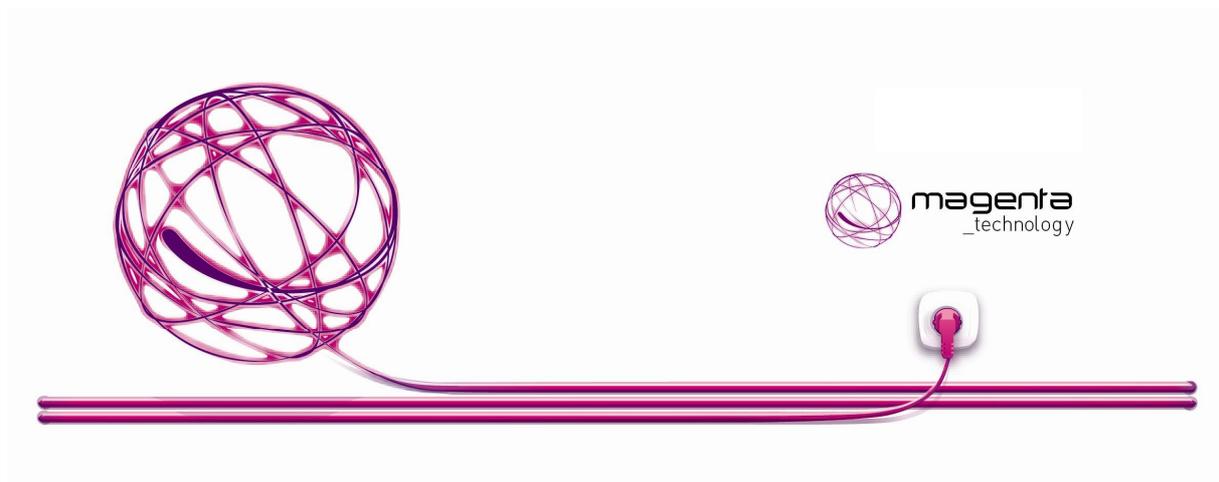




NEW MAGENTA PAPERS

**Scientific Papers
Volume 2**

Intelligent Scheduling and Resources Allocation



**Science Book Publishing House
Yelm, WA, USA
2013**

Reviewed by **Igor Minakov**

Edited by **Anton Ivaschenko**

Samara, Russian Federation – London, UK – Yelm, USA

New Magenta Papers: Scientific papers, Volume 2/ Ed. A. Ivaschenko. - Yelm, WA, USA: Science Book Publishing House, 2013. - 54 p.

ISBN 978-1-62174- 027-8

This is a collection of scientific papers that describe the results of research and development carried out at Magenta Technology. Special attention is given to Maxoptra low-cost scheduling application. Young but experienced medical solutions department is presented by multi-agent software for intelligent scheduling of non-emergency medical patients' transportation in the UK and "Virtual Surgeon" simulation suite aimed to train surgeons.

The papers were presented and discussed at a special workshop in June, 2013.



ISBN 978-1-62174-027-8

Ó **Authors, 2013**

Ó **Magenta Technology, 2013**

CONTENTS

Maxoptra Dynamic Real Time Scheduling Solution.....	7
Implementation of the Theory of Constraints for Transportation Management based on Maxoptra Platform	13
Scheduling by Conditions in Multi-agent Systems	19
GLSP Algorithm for Vehicle Routing Problem	26
The Potential Method for Solving the Transportation Problem with Transit Points	31
Medical Non-emergency Patient Centered Scheduling Solution	40
Virtual Surgeon: The Simulation Suite for Medical Universities.....	47

ABOUT MAGENTA TECHNOLOGY

During the first few years of the company's life, we developed unique multi-agent technology, proving its ability to solve complex, previously intractable problems. The approach of using market forces and micro-economics, rather than mathematical or rule-based algorithms, to devise practical solutions to real world issues proved to be extremely powerful and was applied to a wide number of different sectors and problems. Between 2003 and 2006 the company developed its expertise in the field of logistics but still focused more on research and development than on the commercial exploitation of our technologies.

Since 2006 we have been implementing world-leading dynamic scheduling solutions across a variety of industries, gaining a significant number of blue-chip clients. Following initial skepticism about our capabilities, these clients came to recognize the unique competitive edge that we give them and have often asked for exclusivity in their sector of activity.

In 2007, using our unique technology we created Maxifier - a world leading system for the optimization of online advertising revenues for publishers. We achieved new levels of «Click Thru Rate» optimization without any invasions of privacy.

2008 saw the creation of Maxoptra – our industry changing, low-cost scheduling application that is now being launched across Europe and the USA.

Now Magenta Technology is a leading provider of real-time dynamic software scheduling solutions for flagship players of the transportation industry. Magenta enables them to do more business with the same resources at a lower operational cost. The company provides its customers with competitive advantage and higher margins while enabling them to manage the complexities of an increasingly unpredictable world.

Magenta delivers a combination of complex highly customized real-time dynamic scheduling solutions built to specific business requirements of our customers, and easily implemented off-the-shelf products for 3PL and 4PL providers offered on the Software as a Service model.

Magenta is a UK-based, privately-held company, which is exclusively focused on the creation of efficient dynamic scheduling solutions. With 70 staff based in the UK and Russia, hundreds man-years of development have been spent on establishing world leadership in this sector. Magenta forms part of the Eurovestech (EVT) portfolio of companies (www.eurovestech.co.uk).

Our strategy is to identify niche markets that we can create and lead through using our unique Multi-Agent Technology to solve complex real-world problems on behalf of clients seeking competitive edge in an increasingly complex world.



PREFACE

This is the second volume of New Magenta Papers. The first issue was published in 2012 and attracted high interest of scientists, engineers and developers of multi-agent software. Now Magenta continues publishing the selected scientific papers that describe the results of workshops on Intelligent Scheduling and Resources Allocation.

This digest also includes a description of a new research area, where Magenta recently started developing, which is

Information Technologies in Medicine.

Based on the existing experience of building software for non-emergency medical patients' transportation we have considerably increased our "Medical software department" up to 50 employees and entered into alliance with Samara State Medical University. Such an event helped us successfully finalize the significant project to develop and launch Surgery Simulators for endovascular invasion and laparoscopy and acquire new knowledge on hardware and software solutions for 3D modeling. Now we are open for new projects in this challenging and ambitious area.

New ideas, comments and proposals as well as criticism are welcome: Magenta is open for any new innovation in the areas of resources allocation, IT in medicine and other problem domains.

We need hardly mention that any cooperation and collaboration is invited and appreciated.

edit@magenta-technology.ru

Scientific publication
NEW MAGENTA PAPERS
Volume 2

Proceedings of the 2nd workshop
on Intelligent Scheduling and Resources Allocation

Samara, Russian Federation, June 2013

Edited by **Anton Ivaschenko**

Issue is published in author's edition

Cover designed by Sofia A. Kravets

Assigned to print 28.06.2013. Format 60x84 1/16.
CPP 3,5. Order 0000. Circulation 500.

Science Book Publishing House
17200 153rd Ave SE, Yelm, Washington, 98597 USA
<http://www.sbook.us/>