

Frank Blum

Digital Interactive Installations

Programming interactive installations using the software package Max/MSP/Jitter

Diploma Thesis

Bibliographic information published by the German National Library:

The German National Library lists this publication in the National Bibliography; detailed bibliographic data are available on the Internet at <http://dnb.dnb.de> .

This book is copyright material and must not be copied, reproduced, transferred, distributed, leased, licensed or publicly performed or used in any way except as specifically permitted in writing by the publishers, as allowed under the terms and conditions under which it was purchased or as strictly permitted by applicable copyright law. Any unauthorized distribution or use of this text may be a direct infringement of the author s and publisher s rights and those responsible may be liable in law accordingly.

Copyright © 2006 Diplomica Verlag GmbH
ISBN: 9783956362279

Frank Blum

Digital Interactive Installations

**Programming interactive installations using the software package
Max/MSP/Jitter**

Frank Blum

Digital Interactive Installations

Programming interactive installations using the software package Max/MSP/Jitter

Diplomarbeit
Fachhochschule Köln
Fachbereich Medientechnik
Institut für Medien- und Phototechnik
November 2006



Diplom.de

Diplomica GmbH _____
Hermannstal 119k _____
22119 Hamburg _____

Fon: 040 / 655 99 20 _____
Fax: 040 / 655 99 222 _____

agentur@diplom.de _____
www.diplom.de _____

Frank Blum

Digital Interactive Installations

Programming interactive installations using the software package Max/MSP/Jitter

ISBN: 978-3-8366-0284-6

Druck Diplomica® Verlag GmbH, Hamburg, 2007

Zugl. Fachhochschule Köln, Köln, Deutschland, Diplomarbeit, 2006

Dieses Werk ist urheberrechtlich geschützt. Die dadurch begründeten Rechte, insbesondere die der Übersetzung, des Nachdrucks, des Vortrags, der Entnahme von Abbildungen und Tabellen, der Funksendung, der Mikroverfilmung oder der Vervielfältigung auf anderen Wegen und der Speicherung in Datenverarbeitungsanlagen, bleiben, auch bei nur auszugsweiser Verwertung, vorbehalten. Eine Vervielfältigung dieses Werkes oder von Teilen dieses Werkes ist auch im Einzelfall nur in den Grenzen der gesetzlichen Bestimmungen des Urheberrechtsgesetzes der Bundesrepublik Deutschland in der jeweils geltenden Fassung zulässig. Sie ist grundsätzlich vergütungspflichtig. Zuwiderhandlungen unterliegen den Strafbestimmungen des Urheberrechtes.

Die Wiedergabe von Gebrauchsnamen, Handelsnamen, Warenbezeichnungen usw. in diesem Werk berechtigt auch ohne besondere Kennzeichnung nicht zu der Annahme, dass solche Namen im Sinne der Warenzeichen- und Markenschutz-Gesetzgebung als frei zu betrachten wären und daher von jedermann benutzt werden dürften.

Die Informationen in diesem Werk wurden mit Sorgfalt erarbeitet. Dennoch können Fehler nicht vollständig ausgeschlossen werden, und die Diplomarbeiten Agentur, die Autoren oder Übersetzer übernehmen keine juristische Verantwortung oder irgendeine Haftung für evtl. verbliebene fehlerhafte Angaben und deren Folgen.

© Diplomica Verlag GmbH

<http://www.diplom.de>, Hamburg 2007

Printed in Germany

I want to give special thanks to:

Mr. Prof. Dr. rer. nat. Stefan M. Grünvogel
*for his stimulating impulses and creative considerations,
as well as his constant affable motivation during this work;*

The Dartington College of Arts
*Thanks to the Dean of Information and Learning Christopher Pressler &
the Director of International Development Roger Sell
for making my research at the College possible.
Also many thanks to all other very helpful staff especially in the library,
and to the students for their creative advice,
as well as for practically supporting the work process;*

David Cuartielles
*for his kind invitation to take part in the Electrolobby
of this year's Ars Electronica Festival;*

Carsten Kluth & Mirjam Bregenzer
*for their cordial encouragement in my work,
as well as numerous valuable pieces of advice while going
through all ups and downs during the past four years;*

*Old and new friends, for being there,
as well as for their creative impulses and enthusiastic help
during the time researching and writing this thesis;*

Andreas Witzel, Peter Altendorf, Carolina Ciuccio, Uta Baldauf, Doris Valtiner, Heather Keir-Cross, Travis Kirton and many unnamed others;

*My biggest thanks go to
my parents and my sister
without their kind support and affection
this work would not have been possible in this way.*

Abstract

Title: Digital Interactive Installations; Programming interactive installations using the software package Max/MSP/Jitter

Author: Frank Blum

Advisors: Prof. Dr. rer. nat. Stefan M. Grünvogel/Prof. Dr. Ing. Klaus Ruelberg

Abstract: The present thesis describes the recent development of digital interactive installation art and the usage of the graphical programming environment Max/MSP/Jitter. In the beginning, a brief overview of the present scientific discourse on the key issues interactivity and interface design are given. Furthermore, it portrays exceptional examples of digital art within the past five years, focusing on the main themes of digital installations and software art. This is followed by a description of Max's main features and programming methods, its extensibility with control devices and micro controllers, as well as differences to important alternative graphical programming environments.

The second part of this thesis documents the whole process of creating an interactive installation using Max/MSP and its graphics extension Jitter. This includes a description of the creative concept, the different parts of the soft- and hardware as well as some of their important key techniques. Finally, a summary of user feedback and a personal reflection on the project is given.

Keywords: Thesis, Programming, Max/MSP/Jitter, Interactivity, Interface, Digital Art.

Date: 2006-11-27 (Year-Month-Day)

Contents

List of Abbreviations	vii
1. Introduction	1
I. Cyber Arts	4
2. Recent Development of Digital Interactive Art	5
2.1. Interactivity	5
2.2. Interfaces	7
2.3. Categories of Interaction in Digital Art	8
2.4. Digital Interactive Art	10
2.4.1. Main Themes in Digital Interactive Art	10
3. Max/MSP/Jitter	18
3.1. Max History	18
3.2. Main Technical Aspects	20
3.2.1. Programming Concept	20
3.2.2. Max Objects	21
3.2.3. Messages	22
3.2.4. Programming Rules	23
3.2.5. Data Types	23
3.2.6. Programming JavaScript Externals	24
3.2.7. Programming Java Externals	24
3.2.8. Networking with OpenSound Control	25
3.2.9. Documentation	26
3.3. Hardware Interfaces for Interactive Installations	27
3.3.1. Special Use of conventional Devices	27
3.3.2. Hardware Interfaces for Transducers	29
3.4. Alternative Programming Concepts	31
3.4.1. PD (Pure Data)	31