



Reinaldo N. Togores

# AutoCAD expert's Visual LISP



Covers 3D programming:  
Solids, Meshes and Surfaces.  
Updated for AutoCAD 2013.

**Autodesk**  
Authorized Author

# **AutoCAD expert's Visual LISP**

**Reinaldo N. Togores**

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*To Teté, with love.*



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# Preface

This book is the product of eighteen years teaching Computer Aided Design to Civil and Industrial Engineering students at the University of Cantabria. During this time I have published two books about Visual LISP programming for AutoCAD. Back in 2003 the book *Programación en AutoCAD con Visual LISP*<sup>1</sup> which I wrote in collaboration with Professor César Otero was the first one dealing with this subject in Spanish. For ten years it has been the main resource in Spanish for Visual LISP programming. I still receive messages asking me where to buy it. It is impossible, since it is now out of print. A couple of years ago I undertook the task of preparing an updated version. The new functionalities added since 2003 to AutoCAD required a thorough revision and rewriting of the text. The new book *Experto AutoCAD con Visual LISP* is updated to Release 2012. But being written in Spanish limits this kind of book's readers. My English speaking friends have encouraged me to prepare an English version which may reach a wider audience. During this time AutoCAD 2013 has been released, so the English edition has been updated to cover the few changes introduced from 2012 to 2013.

Back in 2003 when the first book was published, AutoLISP was not "in fashion". Not even with Visual LISP's new contributions. Fashion followers then bet on the novelty represented by VBA. But fashion is not always rationally justified. In that book we aimed to demonstrate that the availability of other Windows dialog box modalities was not reason enough to forgo what had been our way of customizing AutoCAD for more than 15 years. That's why we ended our book with a chapter devoted to Chad Wanless's ObjectDCL, a plug-in which allowed the use of this kind of Graphic User Interface with AutoLISP.

VBA, like all fashions, passed away. It's over and those who opted for it are now hastily rewriting their applications<sup>2</sup>. But AutoLISP/Visual LISP is still here. And ObjectDCL, now OpenDCL, has become an open source project which we can use free of charge. And once more it deserved the new book's last chapter.

I wish this book will guide he who uses AutoCAD in becoming a real expert. That kind of AutoCAD expert that is acquainted with, understands and can manipulate the program's inner workings to achieve the desired output in a fast and efficient way. He who is not satisfied with what comes out of the box, but demands more.

Among the most significant new contributions of recent versions we have 3D modeling, including surfaces associativity. To them, and other advanced techniques, including parameterization, reactors, user graphic interfaces and compiling applications, more than half of this new book is devoted.

The contents are updated to AutoCAD 2013. Source code has been tested with the Windows 32 and 64 bit versions. Although much of the above also applies to previous versions there is

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<sup>1</sup> *Togores, R. and Otero, C.; Programación en AutoCAD con Visual LISP. McGraw-Hill Interamericana de España, S.A.U. ISBN: 84-481-3694-2. Madrid, 2003.*

<sup>2</sup> *On August 6, 2012 Autodesk announced that due to Microsoft's recent renewed investment in VBA, it has become possible for Autodesk to upgrade the VBA engine (in those products that support VBA) from version 6.3 to 7.1. It will be available as a separate download for AutoCAD® and AutoCAD verticals, and as part of the standard installation for Autodesk® Inventor® as of the next release. However, while this means VBA code will not become immediately obsolete, Autodesk does not recommend using VBA for professional application development.*

no excuse not to study it using the latest release. Autodesk offers student versions of most of its software completely free of charge. To obtain them, simply register in the Autodesk Education Community website (*students.autodesk.com*) or in the Autodesk Students Facebook page (<https://www.facebook.com/Autodeskedcommunity>).

The source code for all the examples included in the book can be freely downloaded from my website: <http://www.togores.net/autocadexpert/>, where I have published other materials related to computer-aided design developed during the last twenty years. I hope that you will not only learn from this book, but that you will enjoy doing it.

## **Acknowledgements.**

First of all, I wish to recognize the support received from the Developers Assistance Services of the Autodesk Developer Network with their answers to my many questions when preparing the chapters devoted to the new Mesh and Surface entities. Without this information it would have been difficult to attain the goals I had set myself.

To this I have to add the contribution of the participants to the many AutoLISP forums in the Internet, in particular Autodesk's *Visual LISP, AutoLISP and General Customization* group and the forum at [www.theswamp.org](http://www.theswamp.org). A special mention is deserved by Owen Wengerd and the group of enthusiasts that keep alive the OpenDCL project.

Many of the ideas developed in this book have been tested in exercises proposed during my 18 years as a teacher in the *Geographic Engineering and Graphic Expression Techniques Department* at the *University of Cantabria* (Spain). I want to recognize the contribution of my colleagues and in particular of Professor César Otero, director of my doctoral thesis on *Computational Geometry Methods Applied to the Design of Space Structures*. It was during the work in this thesis that I could investigate in depth some of the procedures for transformations in 3D space proposed in this book. From the University's *Applied Mathematics and Computational Sciences Department* I wish to express my debt with Professors Andrés Iglesias and Jaime Puig-Pey for their research on NURBS curves and surfaces from which I have profited for the preparation of these themes.

No doubt many are the names missing here, but I must not leave out that of Nikolas Bokisch, former Autodesk EMEA Education Program Manager, for his interest in our work and the help that he has always provided.

## **About the Author.**

Reinaldo N. Togores has been using AutoCAD for about 25 years in his work as an Architect and Industrial Designer. For the past eighteen years he has taught AutoLISP programming to Civil and Industrial Engineering Students at the University of Cantabria, in Northern Spain. As a researcher on Computer Aided Design topics he has worked with several research groups at the University of Cantabria and has been a member of the Autodesk Developers Network since the late '90s. He has authored two books about Visual LISP programming.