Live Ambisonic Beta

a design for quick and evocative live spatialization of multiple inputs

continuing from 2007 TES paper “the 'Beast' that is live spatialization”

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Abstract:

This paper presents the software *Live Ambisonic Beta* created by Carey Dodge released in August, 2009. This software allows for quick and evocative live spatialization of multiple inputs from a recording, live, or otherwise. The focus in the creation of the software is interaction design. It uses a single monitor interface, mouse, keyboard and optional Wii remote. The software was created using Max/MSP 4.6.3 and uses third party externals listed below. This paper will discuss the technical and theoretical concepts used to create the application followed by some practical examples. With the presentation of this free software, the author hopes to contribute to more accessible complex spatialization techniques for electroacousticians, musicians and anyone with an interest in sound.

About the Software:

At the core of *Live Ambisonics Beta* there is the Ambisonics Equivalent Panning technology created by Martin Neukom and Jan C. Schacher of the Institute for Computer Music and Sound Technology at Zurich University for the Arts. Details about their work can be read in the paper presented at ICMC 2007 (http://www.icst.net/research/projects/ambisonics-tools/). This technology is more efficient then other ambisonic technologies. Also, its integration into Max/MSP makes it very malleable. This is key for live performance where real-time optimization is essential. *Live Ambisonic Beta* has been used in performances and rehearsal with up to 10 live inputs, 8 outputs, automation and live control on a Macbook Pro 2.2 GHz Intel Core Duo processor and 2 GB of SDRAM with the MOTU 896 interface.

Another 3rd party external used in *Live Ambisonics Beta* is the *trajectory* object by Jean-Baptiste Thiebaut (http://jbthiebaut.free.fr/max.htm). This object automates various trajectories on an xy plane such as, circles, triangles, random and drawn.

Live Ambisonics Beta combines these two technologies with extensive recording and triggering capabilities and a quick user interface.

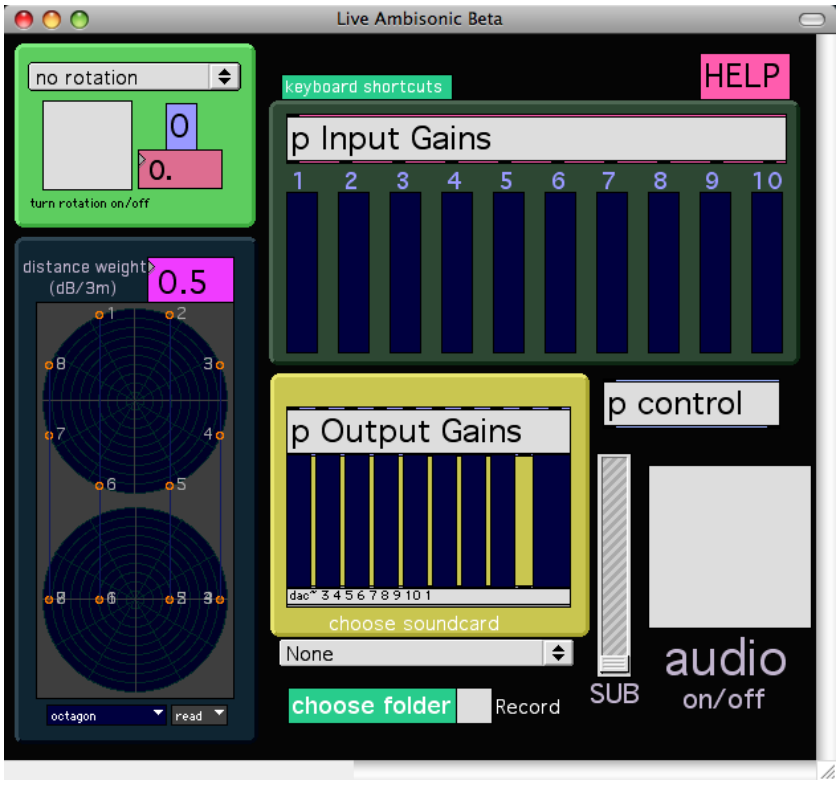
About the Interface:

I stripped down the interface to the essentials of what I believe to be necessary and useful for live spatialization. There are minimal extra features. This was done for two reasons.

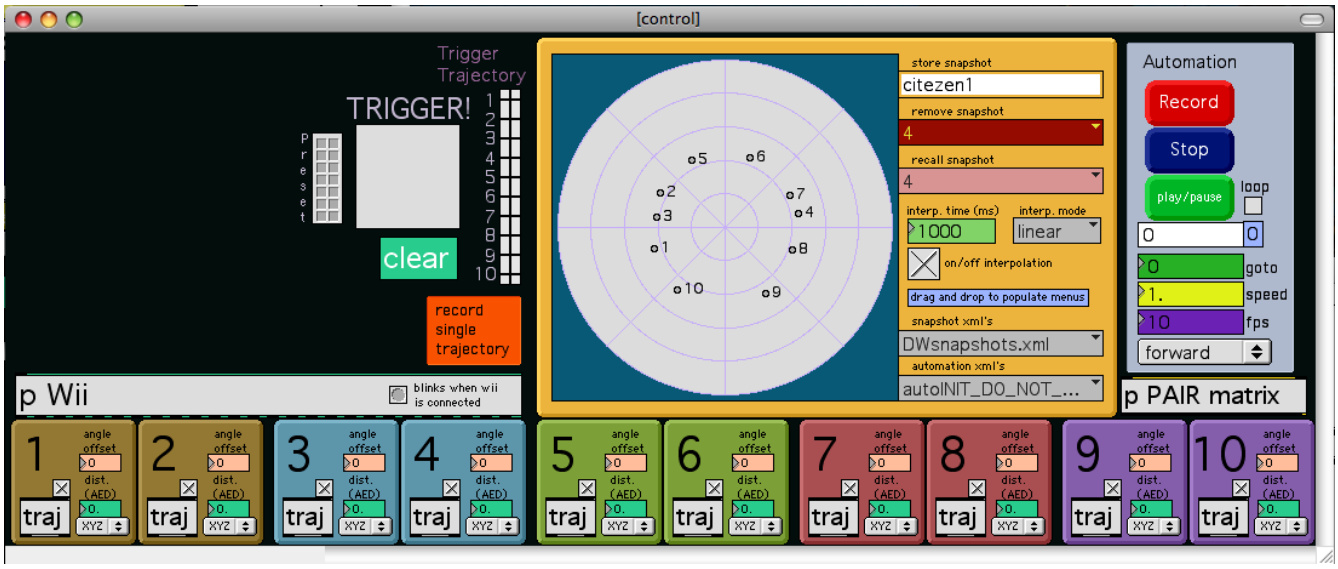
1. Processing efficiency. Live processing is always more demanding then non-real-time processing. It is essential to have a robust system that will not crash during performance. One can automate trajectories, move multiple inputs simultaneously, etc. but there is no Doppler effect, for example. Also, the Ambisonic Equivalent Panning technology used is much more efficient than traditional Ambisonics.

2. Quickness of use. After paring the software down to the essentials, the next step was making everything easily accessible. As much as possible, all aspects of the software are on the 'front-end' or one-click/keyboard shortcut away. That is, almost all of the features of the software are accessible from the two main windows. The hidden windows are mostly used to setup input levels and other parameters that are left alone during performance. Usually only one window ('control') is used during performance.

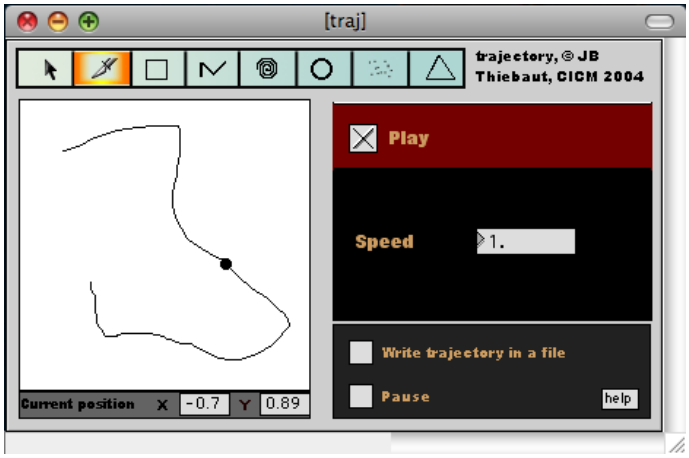
Main window 'Live Ambisonic Beta':



'control' window:



'trajectory' window:



Why no external interface?

This is a question that came up during the TES2009 presentation. Through experience, I have found that incorporating an external interface to *Live Ambisonic Beta* added needless complexity. The main purpose of this software is for quick evocative live spatialization during rehearsal, multi-channel sound reinforcement or a speedily put together performance. Much of the philosophy behind this software is minimalism. Relying on external gear has proved to take up too much time in most time-crunched rehearsal schedules. Often, with external gear, one needs to calibrate it for it to work well. Also, I did not want to make the software specific or dependent on an external device. Finally, external gear takes up space. For my purposes, I found less desk space and less things to look at was more efficient and useful over all. A mouse and keyboard are all I need.

There is Wii capability incorporated into this software but I have not found it useful other than using it for rotating the entire sound space. One should feel free to experiment with this. Adding MIDI control or other communication to external interfaces is not complicated and if anyone wishes it, feel free to do it yourself or commission the author to add it for you.

Live Ambisonics Beta in practice:

The embryonic version of *Live Ambisonic Beta* was first used during a one week workshop with *Boca del Lupo Theatre* (http://www.bocadellupo.com/imaginary.html). During this workshop we were experimenting with various spatialization options for an upcoming show. Using this simplified software was essential for quick prototyping of spatialization ideas and presenting various ideas to collaborators both familiar and unfamiliar with sound spatialization.

The first use of *Live Ambisonic Beta* in its current form was during the *Deep Wireless Conference* in May of 2009 (http://www.naisa.ca/deepwireless/). It was used with the *Deep Wireless Ensemble* which created four 10 minute performances in one week. These performances included four performers, live sound, live mic/instrument input and recorded sound. *Live Ambisonic Beta* was extremely useful in this context where ideas were bounced around very quickly, rehearsals jumped from one piece to another hourly and the time between creation and performance was so compressed.

Live Ambisonic Beta was also used for multi-channel sound reinforcement during the 2009 *Deep Wireless Conference*. This involved everything from one person presentations to panel discussions to concerts with one or more musicians. Again, the simplicity of *Live Ambisonic Beta* was essential in offering the audience quality sound reinforcement with the added excitement of diffusion and spatialization of the live sound.

About the Future:

Live Ambisonic Beta (or a version thereof) will be used in the upcoming performance *An Imaginary Look* by *Boca del Lupo Theatre*. The premiere will be at the Harbourfront Centre in Toronto in the fall of 2010.

A Max5 version is underway and I will upload it to my website soon. Hopefully before 2010.

A request came up during TES2009 to vbap instead of or in addition to the ambisonics used in the patch. This could be added to the patch but due to time constraints, I will not be adding it to this version. If anyone wishes to commission the author to add this sooner then later, just ask.

References:

1. Martin Neukom and Jan C. Schacher. *Ambisonics Equivalent Panning*. Proceedings of the International Computer Music Conference ICMC, Copenhagen, August 2007 http://www.icst.net/research/projects/ambisonics-tools/
2. Jean-Baptiste Thiebaut, *A GRAPHICAL INTERFACE FOR TRAJECTORY DESIGN AND MUSICAL PURPOSES* - Université Paris VIII MSH Paris Nord, Actes des Journées d'Informatique Musicales 2005 (JIM 05), Saint Denis, France http://jbthiebaut.free.fr/articles.htm
3. http://www.bocadellupo.com/
4. http://www.naisa.ca/