Whatever Dance Toolbox
Manual

In the past ten years of BADco.'s choreographic work one of the key issues has been to make visible the process of compositional, improvisational and dynamic decision making in performing our choreographies, or more accurately, to introduce a procedurality of thinking in place of self-expression and the auto-referential choreographic object. With time, specific poetic assumptions crystallized in our choreographic work with procedures that become evident, but not always immediately understandable while performed. Actually, they are not self-explanatory and the complexity of assumptions that the performers operate with often creates the impression that the performance is governed by an alien, external logic.

Our interest has focused precisely on external, "artificial" logics that dance, which idealizes the "naturalness" and division of inner and outer work of expression, disfavors. It seems to us that these logics are a principle mode of correspondence between performance, theater, performers and their environment, whether it be understood in the objectual, contextual, conditional or social sense. In such a process of performance thinking it was impossible to avoid one of the key aspects of expression of the objectification of thought and procedurality in our environment – algorithmic-based forms of mediation and reflection.

Whatever Dance Toolbox emerged from a number of needs – a choreographic analytic desire, demands for mediation between the choreographically literate and illiterate members of the collective, need for visual exemplification of choreographic procedures, and need to transfer the knowledge produced within the collective to colleagues or the public.

While developing software for image analysis for our performances *Deleted Messages* (2004) and *Memories Are Made of This... Performance Notes* (2006) with Daniel Turing, it occurred as logical that the effect of these applications could not be reduced only to the visual communication of performance, but that it also affected its construction. On the one hand, there was a need by the members of the

collective to study the ways in which the "machine sees" performance, on the other hand there was a need to extend the machinic logic to the performance itself and to think about the totality of relations between the performer, setup, performance and generated images as a performance apparatus, a small performance machine or a theater of operations which then plugs into other machines – social, political, emotional, cinematic etc.

This collaboration has resulted in a tool that is no longer just an internal aid for BADco.'s rehearsals and communication of our processes through workshops, but is also a proposal for use to other choreographers, performers and non-performers without the aesthetic considerations of our work.

We would like to thank everyone who participated as an observer or active user in the development of the Whatever Dance Toolbox either at the PAF – Performing Arts Forum in France, or at BADco.'s workshops, as well as those who will continue to send us their feedback.

Choreographic Implications of Whatever Dance Toolbox

Whatever Dance Toolbox is a tool that helps deconstruct basic dance material in real-time and approach it analytically. As most tools, it has its limitations, giving users feedback of the character of movement and its spatial and temporal composition as displayed in the modified 2D image that the tool generates.

After the initial development and testing of the tool, we were able to work on certain aspects of dance movement that eluded us in real-time: to analyze the body's inertia and accelerations as quick responses to the interactivity of the tool, to practice a translation of image into information that becomes a new version of dance movement we can then work on. It has forced us to build a fresh vocabulary for analyzing the resulting dance, as well as for giving feedback to other dancers in a rehearsal situation.

The temporally limited increments of movement reproduced by the Whatever Dance Toolbox – 10 seconds of movement replayed in delay or in reverse, for example – emphasize short phrases the dancer can focus on, creating new iterations, shifting and dividing the attention of the performer, enabling montage in place of composition of movement. We have found these aspects of working with the tool to be procedurally relevant to our work in choreography.

The divided attention of the performer is an element of our approach to working with dancers that we previously persued through multiple simultaneous tasks – such as counting or speaking while dancing, transferring the audience's behavior into the spatial composition of choreography, triggering the interaction of dancers with external verbal cues, etc. The dancer is always simultaneously engaged in processing the external input or cues and the production of the body in motion. Whatever Dance Toolbox as a tool divides the performer's attention by means of the interactive mirror image and constant additional cues indicating how and where to move, distracting the performer from the immediate processing of one's own body's actions. Attention is turned outwards, not on the inner workings of the

movement, but on the negotiation process one enters while attempting to introduce into a body that is already in motion the feedback information from the screen/projection. The dancer becomes more aware of the image of the body, but one that is transformed by the software tool. Switching back and forth between the inner and outside image of one's body in motion can initially be difficult and distracting, but with practice can offer an additional insight into one's own dance. In addition, the dancer's effort to analyze the way the machine "sees" him/her and to translate that into dance is the first step in the objectification of one's dance, a step crucial in the transition from a dancer's gaze to a choreographer's gaze.

Our process in the studio usually starts from an improvisation structured through a series of organizing principles. Whatever Dance Toolbox gives us an instrument to analyze the fragments of created dance movement, immediately making us aware of the compositional aspects of the dance movement and the dancer's use of space in relation to the spatial and temporal framing of the image – limited, delayed, replayed in reverse. This allows an approach to the composition of dance movement akin to cinematic montage procedures. This also raises the performer's awareness of her/his chain of decisions, as phrase execution, spatial position, orientation and quality of movement are all effected.

A composition of several dancers who are in contact in the image without physically touching – results in a specific aesthetic of movement. Jittery, searching, navigational – the movement in relation to those dancing with me, but only as can be seen on screen, while separate in our individual motivation for movement in the actual space. The resulting interactions between multiple dancers have a different, displaced communicative quality – gestures fed back through the tool often become an additional layer of micromovements, while verbal communication reflects a social situation more than a choreographed one.

After five years of experience with using Whatever Dance Toolbox, we are aware that a full evaluation is possible only through its use by others in their own practices and aesthetic approaches to contemporary dance. In our work it has been a methodological instrument that we found we needed, it has influenced not only how we rehearse dance, but the totality of BADco.'s approach towards developing the choreography, spatial and dramaturgical setting of our performances.

A Developer's Perspective
– An Interview with Daniel Turing

BADco. Our collaboration began as a sort of intuitive process: we had no specific goal in mind but rather a curiosity to see if we could find a common interest to work together. We, for our part, gained a lot out of it: a tool that helped us see and analyze our dances more clearly, helped build up a common vocabulary between the dancers and non-dancers in the group, helped build up improvisational imagination starting from very simple movement inputs, placed the problem of divided attention to the forefront of our thinking about improvisation and performing in general, among others. Slowly, over the course of five years, our research on the Whatever Dance Toolbox spontaneously reached a point of closure. What were your expectations, specific interests when you offered us the first rough drafts of this software?

Daniel Generally, what I get from our collaboration is context and focus on a line of work that is otherwise always in danger of drifting into technical navel-gazing. I very much enjoy working on such free projects as a counterweight to the usual goal-oriented processes of software development, but it is sometimes difficult not to spin around my own ideas and lose grip on any relation to the world outside. Working with you is fascinating in that you manage to integrate my "products" into your process, which is so very different to my routine environments. What comes out bears a fascination for me that I could probably describe if I was some kind of art critic.

For the toolbox specifically, I had started out from two premises. The first was to see what "low-hanging fruits" I could reach – technically relatively simple things that might have big potential for your work. We went through a few things, some of which got sacked and some got refined. None of those required detailed planning but instead allowed me to just "hack along" and see what works. It was of great help to me that we decided to move the computers "off stage" and into your rehearsal

process – eliminating many constraints and requirements that "the show" would require, and focus on the dancer/computer relationship instead of the audience.

The second was to explore some differences in perception of human and computer. Intuitively, we think computers are precise. It turns out that dancers have a different and in a lot of ways much more precise understanding of "space" than the algorithms I use. What you perceive as your body center is usually close to, yet substantially something different than the centroid in the tools. The Cage is not really just a two-dimensional rectangle, but instead a pyramidal cut originating from the camera lens.

BADco. We had the opportunity to introduce the Toolbox to very different groups of potential users: dancers, choreographers, dance educators, actors, theater directors, dramaturgs, architects, visual art curators, social workers, professionals working with children with special needs, performing arts theorists etc., which forced us to use the Toolbox pedagogically and creatively in ways we never imagined. But more importantly, all of them had specific points of view on how to apply particular parts of the Toolbox to their practice, with very different goals and end results. Their kind responses were insightful for our understanding of the creative potential of such a simple tool (its limits as well). If you could choose a specific group to offer your software to (besides performing arts practitioners) who would it be and why?

Daniel If there really are therapeutic applications of the software, that would clearly be wonderful. Also I really like when people simply have fun with my work. Still, I guess I'm working with you precisely because I'm not quite sure what the results are, and even when they come in, I'm still left dazzled about what it is you are actually doing. I can see, hear, feel that there is a lot – but it still somehow manages to hide from my understanding. This resistance to my analysis is strangely joyful. I don't need much more.

BADco. How satisfied are you with the results? And in relation to that, do you have a particular interest that you would like to pursue in relation to dance and choreography?

Daniel The only thing I'm dissatisfied with is that I was not able to contribute more. The few tools that now made it onto the CD are really still just the beginning. And also I am unclear where this will lead us. I think we should maybe depart from too-concrete tools and venture into less clearly written out areas. Where the computer is less of a mirror but instead strives to become an emancipated performer. And again, algorithmic simplicity plus human interaction can quickly result in a highly complex output. If we find those things that in their complexity manage to evoke reactions that are once again simple…

BADco. We met you in 2004 when we first saw your motion tracking software we mistakenly called "warsaw/pakt". Why were you interested in trackers?

Daniel What you are referring to I call "the old tracker". It's a simple "binary blob tracker" that I wrote ages ago on a now mostly forgotten operating system ("BeOS"). When you got hold of it, it was indeed "running on" warsaw/pakt. I won't go into too many details of what warsaw and pakt are, but they're both infrastructure parts which were necessary to run the tracker at the time. So necessary in fact that the tracker itself was merely the icing on the cake for software you had to install to get the tracker running.

There's a very simple answer to your question though, it's "to see if I could". See, the essence of hacking (in the non-breaking-into-secrets sense), in my opinion, is about the joy of creating something.

I was into video analysis ever since PCs got powerful enough (and probably my skills became good enough) to actually process video. Motion detection was a natural geeky thing to try. To do motion-reactive installations followed just as naturally. There were these trigger points, much like now – to trigger a recording and replay in Whatever Dance Toolbox, but they would just play sounds. I wanted my software to know more than "there's something moving at position x". I wanted "there are x people in the room, first here, moving that way, other here", … thus, a "tracker".

BADco. Why did you offer Whatever Dance Toolbox to us? Did you have something specific in mind in terms what the software can teach us, something we missed?

Daniel Actually, I just wanted to see what you would do with it.

Whatever Dance Toolbox in Dance Education

During the last five years we have had plenty of opportunity to use Whatever Dance Toolbox in workshops and to present it to a rather varied group of potential users. The insights we received from this experience, from the feedback of people and from our own detailed analysis of the Toolbox applications, enables us to lay out a possible field of its pedagogic applications.

The most obvious application is, of course, in dance and choreography – to learn how to work in a technologically conditioned environment, to understand how the machine "sees" the space and movement, to work with divided attention, to understand the importance of conscious decision making in dance improvisation, to approach improvisation in terms of montage, to learn how to use technology in order to analyze dance and change the quality of movement, to reinvent the quality of relations to other bodies in space... to name only a few findings.

Furthermore, the Toolbox can be extremely useful for explaining basic dance and choreography concepts to non-dancers. Practical concepts such as spatial arrangement, decision making in dance, quality of movement, contact, repetition, accumulation, composition, organizing principle etc. – can all be practically explained with the help of Whatever Dance Toolbox. So, instead of explaining dance only as an expression of the dancer's self or an auto-referential choreographic object, the Toolbox brings to light relational aspects and procedurality of thinking in dance.

Technical Requirements and Setup

Whatever Dance Toolbox requires a simple, straightforward setup to run: a computer with a CD/DVD drive connected by a FireWire cable to a video camera and, preferably, a video projector or a large screen. WDT comes on a LiveCD that you can insert into your computer's CD/DVD drive and boot into the operating system without installing it on your computer's hard drive. If you use WDT as instructed, it will not affect the existing files and operating systems on your computer. WDT comes on an Ubuntu GNU/Linux LiveCD and it allows you also to install the Ubuntu operating system on your computer, however note that the installation of the operating system will not install a fully functional WDT.

WDT is fully operational on a variety of computer configurations, but given the wide array of always advancing hardware that sometimes comes with proprietary, closed source drivers and specifications, we cannot guarantee that it will function on all hardware configurations.

For updated information on Whatever Dance Toolbox, troubleshooting and download of updated versions of the system please visit: http://badco.hr/works/whatever-toolbox/

Technical requirements
— FireWire enabled video camera
— a personal computer with a CD/DVD drive and a FireWire port
  → **WDT was developed and will work best on computers with Intel graphics cards: e.g. Lenovo ThinkPad series or some Intel-based Apple computers**
  → **if your computer does not have a FireWire port, you can install a FireWire card or use a PCI or PCI Express extension card FireWire adaptors, provided your computer has such extension slots**

— FireWire (IEEE 1394) cable with connectors that fit your camera and your computer,
  → **a longer cable will give you room to negotiate when positioning your camera**
— video projector and projection screen
  → **you can alternatively use a computer display or a larger TV display, but for best results use life-size or larger projections**
— cable to connect computer and video projector or screen
— power extension cord

Spatial and optical optimum requirements

— empty room with enough space to move, with a single-color flat-surface background and non-reflective side-walls and floor
— clothes contrasting with the color of the background
— projection screen placed opposite the back wall
— enough dispersed or frontal light that does not wash out the image on the projection
— if there is too much reflection, adjust the threshold within the application you are using

Setting up, initiating and getting to know Whatever Dance Toolbox

1. SETTING UP WHATEVER DANCE TOOLBOX:

Place the camera facing the space that you will be using to move and the computer within reach of your FireWire cable, in a position convenient for you to operate it but without entering in front of the camera. Set the video projection in the opposite direction. Connect the camera and computer with the FireWire cable, computer and video projector with the video cable, plug everything into the power supply. Start and adjust the camera so that it captures the space you will be using to move. Please note that images captured by the camera are stored in the computer's memory – you won't need a tape to capture images, unless you want to record your movement for later use.

projection screen
projector
dance area
computer
video camera
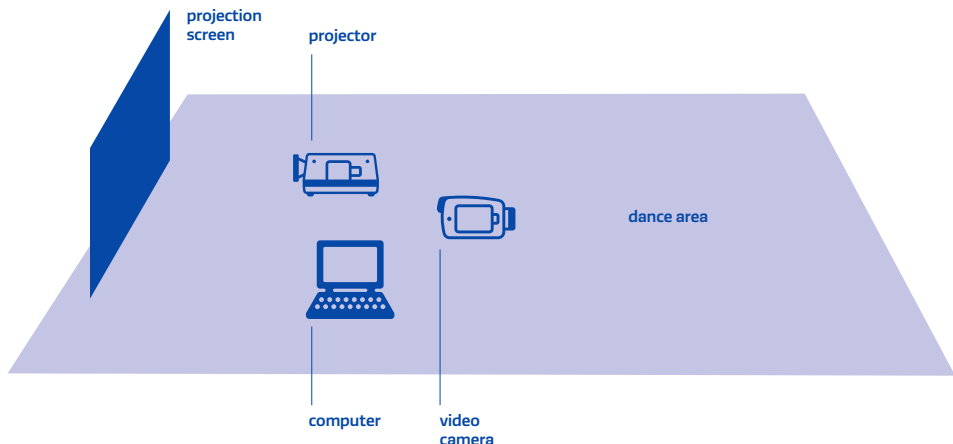
Note that you can try to work with alternate setups, e.g. by filming yourself sideways or from above. For the purposes of this manual we did not work on alternate setups, but that should not deter you from doing so.

2. INITIATING WHATEVER DANCE TOOLBOX

Place Whatever Dance Toolbox LiveCD into the CD/DVD slot of your computer and power it up.

— If your computer is PC-architecture, it might not immediately recognize the bootable CD and boot into the operating system installed on your hard drive. To correct this you will need to enter the BIOS and set the boot order so that the optical drive is listed first. This is easily done and you can find the instructions on how to do this on the internet. After that your machine will first try to boot from a bootable CD/DVD and if no such drive is present, it will proceed to boot from the hard disk.

— If your computer is Mac-architecture, hold down the "Option/Alt" key when starting your computer and it will detect all bootable drives. Point to the CD/DVD drive. It will be mis-reported as "windows", but don't let that deter you. When finished with the LiveCD session and rebooting your computer back to its installed operating system you will have to do the same, this time pointing it to your hard drive.

It will take a few minutes for WDT to load from the bootable CD. Be patient and do not interrupt the process. The whole system is running from a CD. Wait and you will be booted into the desktop environment of Whatever Dance Toolbox. Now you are ready to start working.

3. GETTING TO KNOW WHATEVER DANCE TOOLBOX

On the desktop of your freshly booted WDT you will see shortcuts to individual WDT Tools: Matching Positions, Inertia, Cage, Delay and Reverse, Capture and Replay, Appear – Disappear. You can start any of the individual tools by double-clicking the shortcut icon. Please be patient as the application needs to start from the CD and takes longer than what you might be used to when an application is launching from the hard disk. On the desktop you will also see a folder containing these instructions and a link to the WDT support/download web page.

Your computer is now running a fully functional Ubuntu GNU/Linux operating system that you can use to access the internet or do any of the common tasks you usually use your computer for. If you wish to find out more about Ubuntu GNU/Linux, please visit the Ubuntu webpages.

TESTING IMAGE ACQUISITION FROM CAMERA

Let's first test if WDT is acquiring image from the camera. Double-click on Delay and Reverse tool. It should start, go fullscreen and after a few seconds display the images captured by the camera. If no images appear and the screen is red, please double check that you have properly connected the camera with the computer, that the camera is on and that your FireWire port is working properly. Restart Delay and Reverse tool.

TESTING EXTERNAL PROJECTION

To output the image from your computer screen to your external display or projector, press the shortcut on your keyboard. This may vary from manufacturer to manufacturer. If no image appears go to the Ubuntu-logo menu in the upper left corner and go to System > Preferences > Monitors > Detect screens. The system should detect the external display.

If Delay and Reverse tool is acquiring image, and it is displayed on the external screen and captured images are reproduced by the tool with a delay of 3 seconds, your setup is ready and you can start working with the individual tools.

4. SHUTTING DOWN WHATEVER DANCE TOOLBOX

Once you are done working with Whatever Dance Toolbox, go to the power icon in the top right-hand corner of the menu bar and choose shut down. The system will start to power down. Do not eject the CD or unplug any peripherals before the system prompts you to eject the CD and press enter.

Working with Tools

The print version of this manual includes a comprehensive exercises section based on our years of experience using Whatever Dance Toolbox in workshop and rehearsal situations. For more information and to buy the print version, contact us at badco@badco.hr

Matching Positions

What does it do?

This tool is a task-based tool and is widely applicable in the work of both dancers and non-dancers. It is seemingly simple: one or more persons have to seek a body position so that the individual's onscreen **shape** or the collective onscreen silhouette matches the angle or point given as a task. As you complete a task, you move on to the next one. However, in order to accomplish a task you will have to explore different positions, levels of space, spatial composition, and general spatial dynamics. In our experience, it encourages non-dancers to overcome their inhibition of moving and to progressively acquire awareness of decisions they make with their bodies, of positions and space, of relations they establish to other bodies. Dancers can use it to generate new positions and increase the spatial dynamics of their choreography. To find out more about possible applications, see the exercises section in the print version of this manual.

What is on screen?

When you start Matching Positions and enter in front of the camera, on the black **screen space** you will see a white shape representing the silhouette of your body. The onscreen **shape** is framed by a white rectangle called **extrema** that will change its position and extension as your onscreen shape is changing. If there is more than one body in front of the camera the computer will interpret their silhouettes as composing a "many-in-one" shape.

Within the extrema rectangle you will see a green cross, **centroid**, that represents the geometrical center of the onscreen shape. Its longer axis represents the wider side of the shape framed by extrema, its shorter axis represents the narrower side of the shape. The yellow point represents the initial top point of the longer axis. If you stand upright the centroid's longer axis will naturally be vertical, if you lie down it will be horizontal. As your shape changes over time so will the centroid change its angle and its position.

Stand at an angle of 212°
243.1°

      In the top left corner of the screen you will see the **instructions** indicating either an angle or a position within the two-dimensional screen space that you will have to match by moving so as to move the angle or position of the centroid.

      For more explanations on individual elements of the interface please consult the glossary.

How to operate it?

In order to start working with Matching Positions there should be no one standing in front of the camera. Once the tool has launched you can step in. People or objects that are not participating in the task should not stand in front of the camera, as they will be registered by the computer and optically obstruct the execution of the task. If someone or something is obstructing the view, remove that someone or something from in front of the camera and restart the task by pressing the spacebar. As you complete the task, the computer will indicate a new one. You can always manually cycle through the tasks or restart the task you are already doing.

Functions and shortcuts:

CHANGING TASKS: press "p" or "n" to change and cycle through different angle and position tasks.

RESETTING TASKS: press the spacebar to reset the task. This might be necessary if there was someone or something standing in front of the camera when the tool was initiated.

SCRIPTING TASKS: default tasks in Matching Positions are scripted. If you wish to work with a different sequence of angles and/or positions you need to exit the tool and edit the file "Edit Positions" found on the desktop following the instructions there. Restart the tool.

THRESHOLD: press arrow up (↑) or arrow down (↓) to increase or decrease the threshold of optical sensitivity to the light in the images coming from the camera and interpreted by the computer. Depending on the available lighting, surface glare and garment you may need to bring the threshold up or down.

Inertia

What does it do?

Inertia is a variation of the Matching Positions tool, but it is not task-based. Its primary purpose is to visualize and measure the dynamics of movement. It tracks the individual's onscreen **shape** or the collective onscreen silhouette and follows its geometrical center with an **inertia cross** indicator chasing behind by a preset degree of inertia. It is suited for both dancers and non-dancers to work on the extreme dynamics of their movement – by either focusing on the reduction or the increase of its intensity.

What is on screen?

When you start Inertia and enter in front of the camera, on the black **screen space**, you will see a white shape representing the silhouette of your body. The onscreen **shape** is framed by a white rectangle called **extrema** that will change its position and extension as your onscreen shape is changing. If there is more than one body in front of the camera the computer will interpret their silhouettes as composing a "many-in-one" shape.

Within the extrema rectangle you will see a green cross, **centroid**, that represents the geometrical center of the onscreen shape. Its longer axis represents the wider side of the shape framed by extrema, its shorter axis represents the narrower side of the shape. The yellow point represents the initial top point of the longer axis. If you stand upright the centroid's longer axis will naturally be vertical, if you lie down it will be horizontal. As your shape changes over time so will the centroid change its position.

As it moves, the centroid is chased closely by a small red **inertia cross**, however trailing behind by a preset degree of inertia. So if you are moving intensely, it will never overlap with the centroid, but if you move slowly it will more or less overlap. The inertia with which the inertia cross comes into the position of the centroid can be preset.

For more explanations on individual elements of the interface please consult the glossary.

Observe Inertia
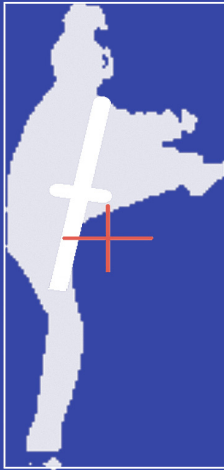
How to operate it?

In order to start working with Inertia there should be no one standing in front of the camera. Once the tool has started you can step in. People or objects that are not participating in the task should not stand in front of the camera, as they will be registered by the computer and optically obstruct the execution of the task. If someone or something is obstructing the view, remove that someone or something from in front of the camera. Start moving quickly trying to prevent the inertia cross from overlapping with the centroid or execute the movements slowly keeping the inertia cross over the centroid.

Functions and shortcuts:

CHANGING THE DEGREE OF INERTIA: press arrow left (←) or arrow right (→) to decrease or increase the inertia.

THRESHOLD: press arrow up (↑) or arrow down (↓) to increase or decrease the threshold of optical sensitivity to light in the images coming from the camera and interpreted by the computer. Depending on the available lighting, surface glare and garment you may need to bring the threshold up or down.

Cage

What does it do?

Cage is a variation of the Matching Positions tool. Its primary purpose is to allow dancers and non-dancers to work with the spatial organizations, containment and composition of movement as seen through a camera lens.

What is on screen?

When you start the Cage tool and enter in front of the camera, on the black **screen space** you will see a white shape representing the silhouette of your body. The onscreen **shape** is framed by a white rectangle called **extrema** that will change its position and extension as your onscreen shape is changing. If there is more than one body in front of the camera the computer will interpret their silhouettes as composing a "many-in-one" shape. The shape is drawn so that its former positions are trailing, allowing the movers to detect where their movement has taken them moments before.

Alongside the white rectangle of extrema there is also another rectangle of the cage. The position and size of the cage can be defined by the user. The white rectangle has to stay within the cage rectangle. As long as it stays whitin, the cage rectangle is green, otherwise it turns red and an alarm is sounded.

For more explanations on individual elements of the interface please consult the glossary.

How to operate it?

Start Cage and with the pointer device on your computer – a trackpad or mouse – click on the screen space where you want to position the top left corner of the rectangle and then drag with the pointer device where you want its lower right position to be. This will draw the rectangle of the cage. Now you can step in. The white rectangle of the extrema will be drawn around your shape. The idea is to keep the white rectangle within the cage rectangle. As long as it stays whitin, the
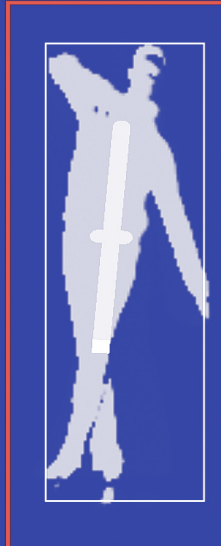
cage rectangle is green, otherwise it turns red and an alarm is sounded. People or objects that are not participating in the task should not stand in front of the camera, as they will be registered by the computer and optically obstruct the execution of the task. If someone or something is obstructing the view, remove that someone or something from in front of the camera.

Functions and shortcuts:

DRAWING THE CAGE: with the pointer device on your computer – a trackpad or mouse – click on the screen space where you want to position the top left corner of the rectangle and then drag with the pointer device where you want its lower right position to be. This will draw red rectangle of the cage.

THRESHOLD: press arrow up (↑) or arrow down (↓) to increase or decrease the threshold of optical sensitivity to light in the images coming from camera, which changes the contrast in the image interpreted by the computer. Depending on the available lighting, surface glare and garment you may need to bring the threshold down or up.

Delay and Reverse

What does it do?

This tool performs simple temporal transformations of the captured image. It has two functions: delay function and reverse function.

The delay function continuously captures and reproduces images delayed by a preset time interval. For example, if the time interval is set to 5 seconds, the captured images will be reproduced 5 seconds later. The delay interval can be set from 0 to 10 seconds. The tool can be used to work on compositional aspects of improvisation or existing dance phrases: repetitions, variations, discontinuities, dynamics. For non-dancers it can be used to generate movement through canons of movement or gestures. To find out more about possible applications, see the exercises section in the print version of this manual.

The reverse function continuously captures images, but creates discontinuities by reproducing them in reverse, again delayed by a preset time interval. For example, if the time interval is set to 5 seconds, whatever was captured last will be reproduced first and then go backward to whatever happened 5 seconds ago. Once that segment of time has been reproduced in reverse, there will be a jump cut to the next 5 seconds that were captured during the previous 5 seconds that were being reproduced. The reverse function can be used for similar purposes as the delay function, but it can also be used to work on transforming the quality of movement. To find out more about possible applications, see the exercises section in the print version of this manual.

For more explanations on individual elements of the interface please consult the glossary.

What is on screen?

When you start the Delay and Reverse tool it will take a default period of 3 seconds for the tool to output the first images – images that were captured 3 seconds earlier. The tool will start by default in the Delay mode, as is indicated in the information area in the top left corner of the screen. In the information area you will also see displayed the preset
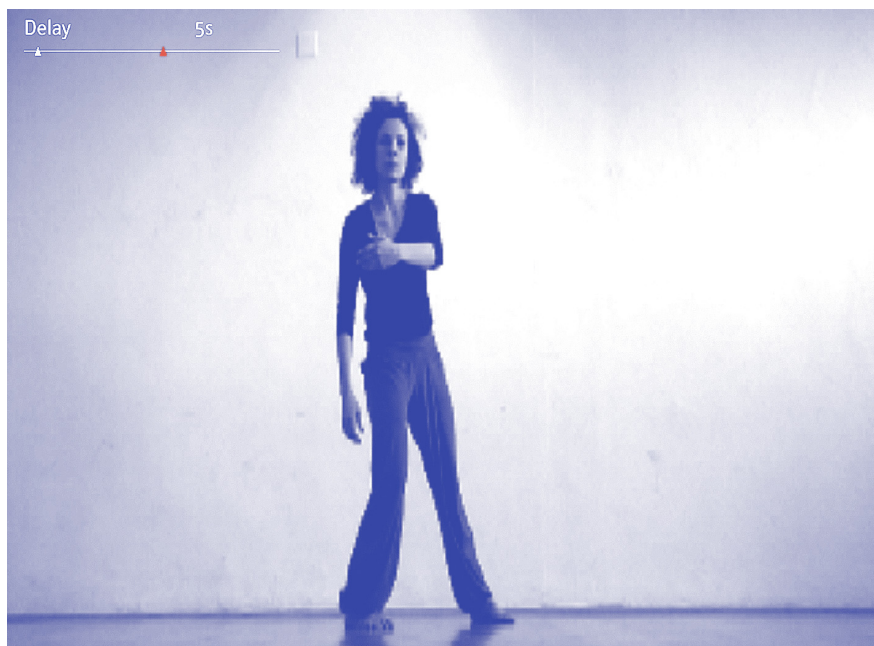
delay time interval and the **time-line**. The time interval can be changed from 0 to 10 seconds.

If you switch to the Reverse mode, this will be displayed in the information area. The red and green arrows on the **time-line** will indicate the time remaining until the time interval currently reproduced in reverse runs out and there is a jump to the end of the next time interval.

Functions and shortcuts:

SETTING TIME INTERVAL: press arrow up (↑) or arrow down (↓) to reduce or extend the time interval. The default time interval is 3 seconds. It can be reduced to 0 and extended to 10 seconds.

CHANGING MODES: press arrow left (←) or arrow right (→) to switch between the delay and reverse functions.

Choreographic considerations:

Owing to the jump cut that the onscreen image manifests, not only a discontinuity in time but also a discontinuity in space is made visible – if I change my position in space while dancing, in the image I am

looking at I will be able to see myself dancing some seconds ago and in some other position in space. The time/space discontinuity creates the possibility for a dancer to approach improvisation as a process of montage. The dancer's compositional decision should occur between the time a dancer spends watching the screen and the time s/he spends dancing. So, it is important to first decide what one wants to incorporate immediately from what one sees on screen: is it only a split-second image of the body (as if someone took a photograph) or a longer fragment of movement? (This will determine the amount of time one spends looking at the reproduced image, the amount of time the attention is directed at the screen.). Here are some further questions a dancer may ask him/herself: If I return to the position I see myself occupying on screen how do I do that? Do I insert other dance material in order to pass from point A to point B? Do I incorporate the orientation of my body as well or do I change it? Do I repeat forms? If yes, how do I manage the repetition? How important are the details of movement I see onscreen? What do I look at while improvising and how does that which I see condition the decisions I am making? How do I keep track of the decisions I have made? etc. The options are various and the outcome will depend on what restrictions and freedoms one allows oneself to work with.

Capture and Replay

What does it do?

This tool can be thought of as an interactive mirror: you can use it to capture up to 30 seconds of images that you can then choose to reproduce in various ways: simple replay, replay in reverse and in slow motion. The recording and reproduction can be operated by the person or persons working with the tool without having to approach the computer, but rather by waving a hand across the **trigger areas** on top of the screen.

The tool integrates the delay function and reverse function but here the capture and reproduction is not continuous. It also integrates a slow motion function that reproduces the captured images slowed down.

The tool primarily serves for analyzing one's own movement and is of particular value when working alone.

What is on screen?

When you start Capture and Replay you will see a live image. In the top section of the screen you will see four red squares that indicate the trigger areas that you will have to wave your hand across in order to trigger the individual functions of the tool. The isolated right square triggers the recording function. The remaining three squares trigger reproduction, from right to left: replay, replay in reverse and slow motion.

In the top left corner of the screen you will see different functions displayed as they get triggered. The information area will also display the changes in recording time.

For more explanations on individual elements of the interface please consult the glossary.
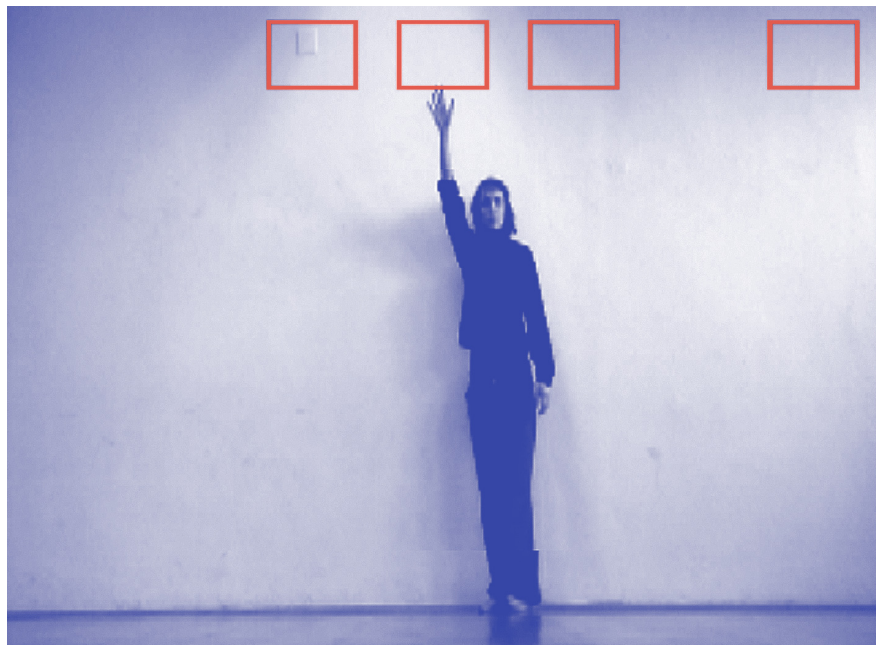
How to operate it?

After starting Capture and Replay make sure that the trigger areas are well above your head, so that you won't inadvertently trigger functions while you are working. If this is happening, tilt the camera up and limit your rehearsal space in the front. Also make sure that the hand you are using to wave across has enough contrast against the background so that the computer can discern it. If this is not the case, stretch your sleeve across the hand or use any contrasting object.

Set up the desired recording time. It can be anywhere between 1 and 30 seconds. For shorter movements or sequences it will be shorter, for longer it will be longer. It's up to you. If you are now ready to begin, wave your hand across the right-most trigger area. The tool will count down and beep 3 seconds before it starts recording. It will record for the desired time interval. Once the recording is finished you can then trigger different modes of reproduction of the captured sequence by triggering, from right to left: replay, replay in reverse and slow motion. When you have finished and are ready to start with another repetition or another movement, again use the right-most trigger area.

Capture and Replay

Functions and shortcuts:

SETTING RECORDING TIME INTERVAL: press arrow up (↑) or arrow down (↓) to reduce or extend the recording time interval. The default recording time interval is 5 seconds. It can be reduced to 1 and extended to 30 seconds.

Appear – Disappear

What does it do?

This tool can be thought of as a photographic plate being constantly re-imprinted by the captured image: the more static parts of the image remain in focus while all quick movements become blurred.

The tool primarily serves to produce and analyze different speeds of movement of one's body or different speeds of movement in space.

What is on screen?

When you start Appear – Disappear you will immediately see the live image output with blurring of the image proportional to the speed of the moving body or its parts – from in-focus still body, to completely blurred out body in quick motion.

Choreographic considerations:

Working with fragmentation in dance usually implies isolation and often this isolation happens on the level of joints. If you take a body surface visible on screen as the basic element of fragmentation, an element that you try to isolate from the rest of the body and organize the movements around it, it drastically changes the way you articulate the whole body. To move around a surface is of course, a task possible only in imagination, but dancing is always about working with images, with our power to imagine movement, how it looks and feels or in other words, with perceptive images – information one receives through the senses (sight, hearing, touch, proprioception, vestibular sense and pain) which with experience settle into stable images our body remembers and repeats.

Once you start to insert different image-mappings of the body into the process of dance improvisation a space opens for creating new images and consequently learning about your own dancing body.

Whatever Dance Toolbox – Manual

Glossary

Centroid is the geometric center of the silhouette. It is the approximate intersection of all straight lines that connect opposite points on the silhouette outline. It is represented by a green cross with two axes: the dominant, longer axis and the secondary, shorter axis perpendicular to it. The dominant axis has a yellow point at its end. As the silhouette extends, so does the centroid. The dominant axis always reflects the most distant outer points of the silhouette. For example, it will be vertical if you stand up straight, it will be horizontal if you lie down. If there is more than one person in front of the camera the centroid will treat all the shapes on the screen as a single silhouette, or in other words, the dominant axis will connect the most distant points of the "many-in-one" plane figure.

Extrema is the white square framing the outline of the silhouette and following its extension. It is defined by the outermost pixel in the respective direction.

Inertia cross is a red cross whose movement is directly related to the movement of the centroid. The quality of that relation could be described as elastic inertia.

Instructions are displayed in the upper left corner of the screen indicating the task and the position or angle of the centroid.

> **EXAMPLE 1:**
> "Stand at an angle of 45°"
> "120°"

The task "Stand at an angle of 45°" means that the dominant axis of the centroid should match the angle of 45°. The task is represented visually on screen as a red line for easier orientation. The information in the second line "120°" states the information about the current angle of the dominant axis. This angle value changes constantly depending on the current extension of the silhouette.

"Move to 0.8 / 0.7"
"0.5 / 0.5"

The task "Move to 0.8 / 0.7" means that the center of the centroid should be moved into a position on screen to match the point defined by the coordinates 0.8 on the horizontal axis and 0.7 on the vertical axis.

The information in the second line "0.5 / 0.5" shows the current coordinate position of the centroid within the screen space. This information changes as the silhouette changes its shape and position.

Screen space is defined by a simple coordinate system with two axes. On the horizontal axis 0.0 denotes the left edge of the screen space, whereas 1.0 the right edge of the screen space; on the vertical axis 0.0 denotes the top edge of the screen space, whereas 1.0 the bottom edge of the screen space.

Shape is a plane figure we see onscreen as a pixel representation of our body in front of the camera. It is white. As we move it extends over the screen space.

Whereas **Silhouette** has a more technical meaning, it is the shape for the software analysis; if we have more persons in front of the camera we will see more shapes on screen but there will be only one silhouette for the computer. When there is only one person in front of the camera the terms shape and silhouette mean the same thing.

Time-line is located in the upper left corner of the screen and indicates a time interval.

Trigger areas are represented by four red rectangles in the top part of the screen. If something moves over one of them (e.g. you raise your hand and 'touch' it), it will trigger an action. Looking from right to left of the screen, the first rectangle captures a preset time interval, the second replays the captured material exactly as captured, the third replays it in reverse and the fourth reproduces it in slow motion.

BADco.
is a Zagreb-based theatre collective.
The collective, a confluence of interests
in choreography, dramaturgy and
philosophy, is nowadays made up of
Pravdan Devlahović, Ivana Ivković, Ana
Kreitmeyer, Tomislav Medak, Goran
Sergej Pristaš, Nikolina Pristaš, Lovro
Rumiha and Zrinka Užbinec. Since
it was founded in 2000, it has been
systematically focusing on the theatrical
and dance performance as a problem
field – questioning the established
ways of performing, representing
and spectating. A red thread running
through their work has been to approach
the theatrical act as an unstable
communicational exchange, a complex
imaginary challenging the spectator to
peer beyond the homogenizing media
reality and reclaim her or his freedom of
spectating.

http://badco.hr

Daniel Turing
works and lives in Hamburg. Too
technical to be an artist but too
experimental to be a programmer, Daniel
is lead by his interest to overcome the
limiting current modalities of human-
computer interaction, enabling people to
tap into more of the expressive potential
inherent in the digital in more intuitive
and playful ways. He graduated in Media
Arts and Design at Bauhaus-Universität
Weimar in 2004 after studying with Jill
Scott, Ralf Homann and others and since
tries to bridge the divide by setting up
installations or performances, often
involving camera/projector setups and
handcrafted video analysis/synthesis
software. With these, he aims to
enchant people as much as allow them
a glimpse into how computers work – a
visualization of what the machine sees.

http://danielturing.com