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“Digitizing Danny:
Capturing Grossman’s *Curious Schools of Theatrical Dancing* (1977)”
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ABSTRACT: This report describes a project to document Danny Grossman’s signature solo, “Curious Schools of Theatrical Dancing” (1977, inspired by Gregorio Lambranzi’s 1716 treatise), for the dual purpose of education and reconstruction. The emerging technology of motion capture is explored alongside key frame computer animation as innovative methods for “capturing” choreographic works, to complement traditional methods such as words, video recording and notation.

This report describes a project to document a seminal work by Danny Grossman, whose choreography has been performed by modern dance and ballet companies in Canada, the US and beyond. It has developed into a pilot project to explore the use of key frame and motion capture animation as a complement to more traditional methods such as words, video recording and notation.

Danny Grossman

Born in 1942 in San Francisco to a Polish-Hungarian Jewish father and an Irish Catholic mother, Danny Grossman grew up in a strongly politicized household. He began studying modern dance in his late teens and performed with the Paul Taylor Dance Company from 1963-73 under the name Daniel Williams. Grossman then moved to Toronto as guest artist with the Graham-based Toronto Dance Theatre, eventually forming his own troupe, the Danny Grossman Dance Company. Over the past three decades, he has created works for his own company as well as the Paris Opéra Ballet, Les Grands Ballets Canadiens and the National Ballet of Canada, and has revived and staged significant works by North American choreographers. A lifelong activist, Grossman has worked to educate the community and politicians about cultural issues through dance, and has spearheaded initiatives to preserve his choreographic legacy. Canadian dance critic Max Wyman has said, “Danny Grossman's roots as an individual and as a creative artist are bedded deep in a single principle - a questioning of the conventional, and an unwillingness to settle for the status quo.” Social awareness and humanistic concerns are themes that animate his poignant, often humorous work. In his own words, Grossman says, “I create dance about humanity. My repertoire and my company reflect my personal belief in equality, pacifism, honesty, courage, compassion and social responsibility.”

Danny Grossman Dance Company (see <http://www.dannygrossman.com>)

The Danny Grossman Dance Company (DGDC) was founded in 1977, with a core of Grossman works characterized by powerful social themes and hyper-athletic, angular

movement. Many of Grossman's dancers have stayed with him for decades, giving the Company a coherent, distinctive style that reflects his quirky physicality and wit. DGDC members actively participate in community-based programs such as residencies, lectures and seminars. Based in Toronto, DGDC began to tour Canada and the US in 1978, and accumulated a repertory of about 40 Grossman works. It soon added works by significant American creators, including Horton (*The Beloved*, 1948), Taylor (*Aureole*, 1962), Sokolow (*Rooms*, 1955), and Weidman (*Lynchtown*, 1936). In the 1990s, the DGDC initiated a policy of reviving and staging Canadian works considered significant but neglected, including those by Carol Anderson, Patricia Beatty, Rachel Browne, Lawrence Gradus, Peter Randazzo and Paula Ross. Echoing concern for the future of humankind expressed in his anti-war piece, *Endangered Species* (1981), Grossman envisioned a bleak future for the art of Dance if artists failed to respect and conserve its choreographic legacy. Ever the activist, he developed a plan.

Endangered Dance (see <http://www.endangereddance.com>)

Grossman had taken part in the Repertory Etudes Project of the American Dance Legacy Institute. In 2005, he spearheaded an initiative to preserve what he considered endangered Canadian dance works. On January 19-20, 2006 DGDC hosted Endangered Dance: A National Dance Heritage Forum, to draw attention to the urgent need to develop a strategy. Over 90 delegates from across Canada met to share information and resources, identify common themes and set action steps. DGDC presented a three-year plan to document key Grossman works, as part of an ongoing institute to facilitate the professional recording, licensing and teaching of his repertoire. One of these works was *Curious Schools of Theatrical Dancing*.

Curious Schools of Theatrical Dancing: Part I (1977)

Grossman's signature solo was inspired by an 18th century Baroque dance treatise. Venetian ballet master Gregorio Lambranzi's *New and Curious School of Theatrical Dancing: The Classical Illustrated Treatise on Commedia Dell'Arte Performance* (1716), described steps and dances of the "grotteschi", the centuries-old style of dancing that incorporated acrobatics and pantomime as part of popular Italian comic theatre. This was in contrast to the noble style of dancing codified by the French academy founded by Louis XIV in the late 17th century. Many of Grossman's movement images were inspired by illustrations in Lambranzi's book (see Fig. 1).

The work is set to a five-act dramatic suite by François Couperin (1717). "Les Fastes de la Grande et Ancienne Ménestrandise" (the annals of the great and venerable minstrelsy) depicts minstrels, beggars, jugglers, tumblers, monkeys, bears, drunkards, invalids, contortionists and, most importantly for Grossman, "those crippled in the service of the great minstrelsy" (<http://members.aol.com/realmac/fastes.htm>). The suite may have been composed to satirize the victory of late-17th century composers and dancing masters who obtained royal approval to establish an academy separate from the Confrérie de St. Julien-des-Ménétriers, a guild that had controlled them since the 14th century.

The dance's central image is of a lone, disfigured soul encased in a circus ring, forced to perform for an unseen master. Critics have described him as Everyman, a clown, a puppet and a Christ figure. The work builds from a seemingly benign opening to a frenzied

climax described by Grossman as “a demonic dance to the death.” To contrast the “grotesque” dance style of *commedia dell’arte* with the “noble” style of late 17th century court dance, Grossman often skews academic ballet positions: fifth position of the arms is an angular form held off to the side rather than a centred oval; the dancer performs asymmetrical beats with one flexed, “clubbed” foot rather than elegantly symmetric pointed feet. The figure may not have perfect form, but he has an invincible spirit. The hyper-physical solo is a dramatic and technical *tour de force*.

Although Grossman created the solo for himself (see Fig. 2), he has not danced it since 1987, and has passed on the work to various company members. Eddie Kastrau, who has performed the solo since 1988, has been instrumental in documenting the work on video and DVD.



Fig. 1. Image from Lambranzi’s *New and Curious School of Theatrical Dancing* (1716)



Fig. 2. Danny Grossman in *Curious Schools of Theatrical Dancing* (1977)
Photo by Andrew Oxenham

Documenting *Curious Schools*

As mentioned, DGDC aims to document Grossman’s key works for education and reconstruction purposes. Its archives have routinely collected traditional media that focus on the *product* of choreographic invention, including rehearsal and performance videotapes, production information, program notes, and critical reviews. More recently, the Endangered Dance project has generated resources that focus on the *process* of teaching and learning a work. For *Curious Schools*, Grossman and his principal dancer Eddie Kastrau are compiling a DVD that presents the choreographer teaching the dance section-by-section, then discussing dramatic intent; the dancer explaining how to wear the costume (tunic, sleeves and cuff); the crew assembling and dismantling the set (a circus ring); and an overhead run-through for blocking the dance. The section breakdown

includes the choreographer's comments, images, and teaching points as well as the dancer's feedback and performance tips.

The unique component of the *Curious Schools* project is the creation of key frame computer animation based on input from the choreographer and Kastrau, and a corresponding motion capture animation. Since 2003, I have been working with Grossman and Kastrau to create an animation of the solo using DanceForms (see <http://www.charactermotion.com>). In 2007 Kastrau's performance was digitally captured at Western Michigan University under the auspices of the Digital Media in the Performing Arts Innovation Grant, directed by Kevin Abbot and David Curwen (see <http://www.wmich.edu/digitalmedia>).

Computer Animation: Classical (key frame) and Motion Capture (mocap)

Classical animation is the process of inputting a series of key frames to describe a sequence of body positions. Animation programs interpolate transitions between set key frames to simulate continuous motion. Because the animator sets positions defined by the choreographer, key frame animation ideally produces a record of the choreographer's intent, much like a notation score. It *prescribes* the dance.

Mocap is the process of digitizing the performance of a specific mover. Sensors applied to the dancer's body reflect infrared light that is recorded by cameras positioned around the performance space. The position of each sensor is continuously tracked. (Computer interpolation or manual editing may be needed to generate lost data.) Because the cameras track positions achieved by the dancer, mocap animation produces a record of one performance/interpretation, much like a film or videotape. It *describes* the dance.

Both formats have unique advantages and limitations when compared with each other and with traditional methods like word notes, videotape and notation. Like video, both animation formats provide a 3-D visual representation, but animation is viewable from any angle, and more editable. Like notation, key frame animation represents the choreographer's intent, but animation requires no special training to "read". Key frame animation is less realistic but easier to edit than dense mocap data. Mocap is faster but more expensive to produce than key frame animation, although the cost will likely decrease as more studios are opened to accommodate the growing games industry. Comparing and contrasting these two animation formats of *Curious Schools* has provided helpful insights that may lead to new methodologies for documenting choreography.

Classical Animation of *Curious Schools*: Strengths and Limitations

Key frame animation of *Curious Schools* has been ongoing over the past four years. Lawrence Adams, the late cofounder of Canada's Dance Collection Danse archives, proposed a pilot test to determine whether computer animation could represent the essential structure of a dance. Selecting what he considered a "trial by fire", he challenged me to draft the final section of *Curious Schools* from a videotape of Danny Grossman (*The Dancemakers*, directed by Moze Mossanen, Rhombus Media, 1987). Adams and Grossman agreed that the initial DanceForms draft demonstrated promise, so I began to work with Grossman and Kastrau to produce drafts of the remaining sections and to revise the final section based on their explicit information.

Animating from a performance videotape offered similar challenges to learning the dance from one: the camera angle constantly changed, making it difficult to determine the dancer's orientation, especially since the black background and circular stage set provided no frame of reference. Close-up shots often masked key information about arm actions or steps. Most importantly, the performance showed what Grossman did versus what he had set (he was about 45 at the time, but still an arresting physical and dramatic presence). I often had to make decisions based on incomplete information.

Animating based on demonstrations and explanations from Grossman and Kastrau was more satisfying, although they found it challenging to break down and articulate what they had been doing for so many years. (The optimal situation would be to begin documenting the choreography as the work is being set). There were also instances when what was said and what was demonstrated did not correspond, as is often the case in learning choreography. Finally, the movement itself was so complex that it required great skill in key frame animation. I had to make practical decisions about how much time to spend refining the animation: how good is good enough? A key question to be addressed in creating animation for reconstruction purposes is "How realistic must a representation be, to help a dancer to learn the choreography?"

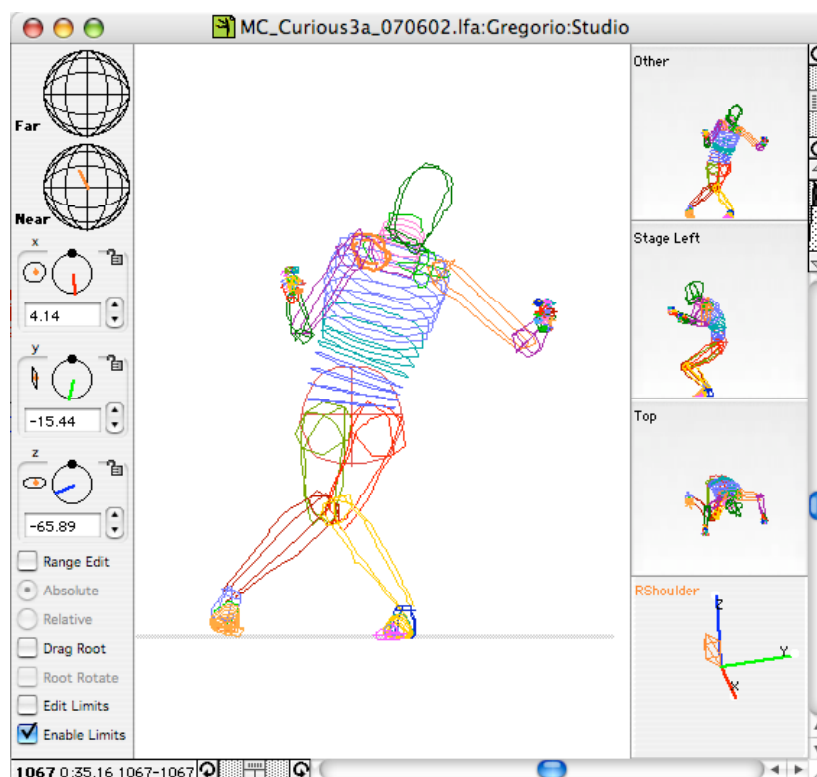


Fig. 3. DanceForms key frame animation of *Curious Schools* Section 3. "Down to Knee Balance": Studio window of key frame figure

The product reflects these conditions and decisions. As a record of what Grossman specified to be the key elements of *Curious Schools*, the key frame animation is limited by the medium itself, the information specified by the choreographer, and the skill of the

animator. While it demonstrates basic positions and movements, key frame animation clearly lacks realistic transitions and dynamic shadings. The product is a robot-like rendition of the dance, requiring a human interpreter to bring it to life. This brings to mind W.B. Yeats's question, "How can we know the dancer from the dance?" (Among School Children, 1926).

Mocap Animation of *Curious Schools*: Strengths and Limitations

The mocap session took place at Western Michigan University on May, 5, 2007. It presented unique challenges for the dancer and the mocap team.



Fig. 4. Eddie Kastrau in the mocap suit with about 50 light sensors
Photo by Christina Loewen



Fig. 5. Eddie Kastrau in *Curious Schools* Section 3: "Down to Knee Balance"
Photo by Christina Loewen

The mocap set-up was previously used to capture characters for the animated feature *The Polar Express*. Kastrau wore a mocap suit like the one used for Tom Hanks, who portrayed several characters, including the Conductor.¹ The suit had about 50 sensor balls, each of which was tracked in 3-D space for the length of the ten-minute solo.

Kastrau described the performance situation as being "very dry" compared to the magic of a live theatre space: there was no real audience to play off; the lighting surrounded him, without an accustomed "black void"; the absent circus ring was indicated by tape, with a "T" reference for front. During the shoot, Kastrau experienced some problems: the suit was tight and limited his movements; the sensor balls caused pain and bruising during the rolls, the flashing lights caused some disorientation; the open-soled bootie with foot sensors slipped around, impairing his traction. The technicians noted several instances in which data from some sensors were incomplete. For example, sensors on Kastrau's back could not be tracked when they were on the ground during somersaults and logrolls. The configuration of a foot was hard to model when the bootie slipped; also, more sensors might be needed to capture the shape of the character's supposedly clubbed

¹ Teams of artists are employed to create animated features, with individual animators responsible for small portions of the whole. A typical animator's output may be eight seconds of rendered animation per week for a single movie character.

foot. When data was incomplete, the computer would interpolate reasonable transitions or the technicians would make manual adjustments to the files.

These factors, however, were overcome by adrenaline to produce what Kastrau described as a fascinating experience. On the plus side, Kastrau was able to wear kneepads throughout the grueling solo and the entire work was captured in one take.

After the session, Kevin Abbott and his assistant Micah Stieglitz converted the mocap files into a format that could be read by DanceForms and mapped to the Male Modern figure.

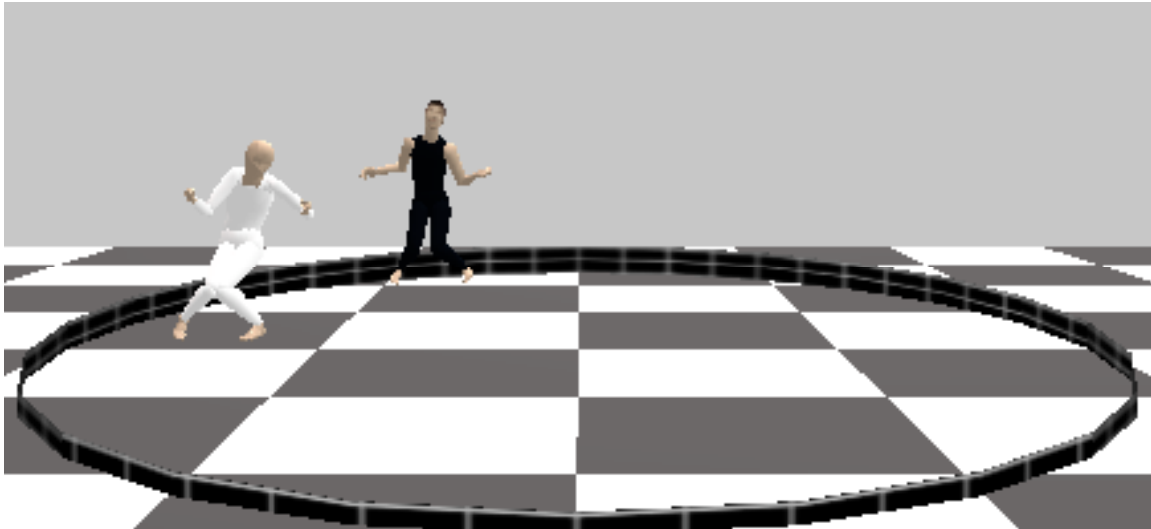


Fig.6. DanceForms mocap animation of *Curious Schools* Section 3. “Down to Knee Balance”: key frame figure in white; mocap figure in black

Discussion

Any evaluation of key frame versus motion capture animations must take into account the unique strengths and limitations of each approach. As stated, key frame animation *prescribes* while mocap *describes* the dance. The former aims to be more abstract (what should be²), the latter is more realistic (“what is”).

Ideally, the choreographer should animate the work himself to ensure that it captures his intention. As in notation, the more familiar the notator/animator is with the choreographer’s style and technique, the more reliable the score². Never having danced in a Grossman work, my physical understanding of his movement vocabulary was clearly limited, and this would be reflected in the key frame animation. Likewise, it would have been ideal to capture Grossman performing his own signature solo. Although the technology was not available during his dancing career, we were fortunate in mocapping Kastrau, who has been performing the work for almost 20 years.

² Historically, very few choreographers have been proficient enough to notate their own works, two notable exceptions being Artur Saint-Léon (Pas de Six, *La Vivandière*, 1844) and Vaslav Nijinski (*L’Après-midi d’un faune*, 1912).

Facial expression is sometimes a meaningful part of what the choreographer sets (as, for example, in Grossman's *Endangered Species*, particularly for the General). However, in *Curious Schools*, the dancer's face is meant to reflect his physical experience; its absence is not a limitation here.

Remembering Yeats's question, we might say that mocap helps us know the dancer, while key frame helps us know the dance. But can they be separated? The question remains, could a dancer use the key frame animation to learn the structure of the dance, then—through performing it—find the essence for himself, without reference to another performer's interpretation? This is antithetic to the history of our profession, but opens interesting possibilities long available to musicians and actors.

One final anecdote: at the mocap session dancer Eddie Kastrau asked animator Kevin Abbott about ways in which the motion capture data of *Curious Schools* could be used. He wondered if the dancer could be clothed in another costume, with a new setting, etc. Abbott replied that once the data is processed, it can be manipulated in a number of ways. Kastrau's movements could be even mapped to a variety of "characters", skeletons or architectural forms, including dinosaurs so often the subject of early animated features – giving new meaning to the phrase Endangered Dance.

Summary

Within the context of this pilot project, Grossman and Kastrau have offered a summary of how they envision passing on Grossman's work⁴. For as long as possible, the best method remains live demonstration by Grossman or one of his dancers who has performed the role. Video then motion capture animation would be useful for representing the quality of movement. Key frame or more refined motion capture animation would be helpful to convey exact details like hand gestures. For facial expression, video is preferred.

Conclusions

As university educators we bear the responsibility for educating students and future audience members about our ephemeral but rich dance heritage. We also face the challenge of finding ways to pass on the legacy of today's choreography to future generations. This project has demonstrated various advantages and limitation in the use of computer animation as a documentation tool to complement word notes, film or videotape records, and notation scores. As we gain experience in using these various media to mine the unique strengths of each, we hope to expand our arsenal of tools and meet the challenges of preserving dance in the 21st century.

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⁴ E-mail communication with Eddie Kastrau, June 20, 2007.

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