

‘Bionic arm’ revolutionizing prosthetic limbs—Kuiken

TOM WAGNER
News Staff

Todd Kuiken, a doctor from the Rehabilitation Institute of Chicago, brought the future to Edmonton on Monday afternoon with a presentation on the “bionic arm,” a prosthesis he developed that takes a patient’s own nervous-system signals and uses them to move a motorized arm.

The procedure, which was first performed in January 2002 on a double-amputee patient in Chicago, has now been performed 20 times. But that’s about to change, as Kuiken didn’t only come for the lecture: his visit also included consultation here with local doctors in order to bring the bionic arm to two Edmonton patients.

The procedure is revolutionary, Kuiken said, because it allows for intuitive control of a prosthesis. That is, the patient only has to think what action they want to perform—for example, “close hand”—and their prosthetic hand will close.

This is possible, Kuiken explained, because the nerves that usually run to the arm are attached to the patient’s pectoral muscle or bicep, depending on whether the amputation was below or above the elbow. This means that the brain can send signals to the nerves it normally would to move your arm.

These electrical signals are then picked up by electrodes on the patient’s skin and fed into the prosthesis. This system is such an improvement on old prostheses, Kuiken said, that in tests such as moving wooden blocks, patients were up to six times faster with their “bionic arm” than their old prosthesis.

Kuiken said he has also observed some amazing side effects after attaching these nerves to the patient’s pectorals: many of the patients feel sensation in their missing hand when pressure is put onto their pectoral muscles and the surgically attached nerves.

Kuiken has exploited this by attaching a device called a tactor to patient’s chests, which applies pressure proportional to the pressure applied when they close their prosthetic hand, giving them sensation in their missing hand.

“We put a ‘plunger’ on [the patient’s] chest so he can feel how hard he’s



JENNY FROGNER

LENDING A HELPING ARM Dr Todd Kuiken discusses inventing the bionic arm.

squeezing when he closes his hand,” Kuiken explained.

This can result in surprising sensitivity, he said. For instance, one patient could distinguish between different grains of sandpaper when she felt them with her prosthesis.

But despite the success, Kuiken has also encountered problems. The number one complaint of patients is how long it takes to put on the arm.

“It can take up to five minutes to put on your arm,” Kuiken explained. “That’s just not acceptable.”

He has also experienced problems with the durability of the arm. One patient, for instance, broke off twelve stainless steel bolts while attempting to pull-start his lawnmower.

Still, Kuiken has had only one failed procedure out of 20 operations—and

even that one wasn’t his fault, he said. When the surgeon opened up the patient, he noticed that their medial nerve, one of those used to send signals to the prosthetic arm, was withered up, an unfortunate result of the patient’s amputation. However, Kuiken accepts that this will happen from time to time.

“Most people don’t lose their limbs gently,” he explained.

Since developing the arm, Kuiken has continued to improve on it, and enormous strides are continuing to be made. However, the importance of the work already done can be seen in patient’s grateful reactions.

“My first arm just wasn’t worth wearing,” said Claudia Mitchell, one patient who has received the bionic arm. “This one is.”

NEWS BRIEF

LECTURE EXPLORES REALISM IN CITY OF GOD

In her lecture *The City of God* and the Questions of Realism, Dr Lúcia Nagib, Centenary Chair of World Cinema at the University of Leeds, discussed the issue of cinematic realism in the Oscar-nominated 2002 Brazilian film *City of God*.

Nagib, who specializes in the study of contemporary new world cinema, discussed the issue of realism in Brazilian cinema to an audience of film studies academics. She discussed such topics from the use of linguistic devices to intersemiotic translation—the transformation of a medium from a literary to a visual form.

“In both the book and the film *City of God*, the degree of realism is striking,” Nagib said, discussing how the film portrays life in Brazil’s impoverished favelas—shanty towns located on the edge of

Brazilian urban areas characterized by poverty, crime, drugs, and gang-related violence.

“It gave literary expression to an issue that is today central to Brazil: ‘favelization’—[the] spread of favela communities—and the war on drug-dealing,” she said.

Nagib also described how linguistic devices and structure were used in *City of God* to enhance the film’s realism while providing symbolic meaning.

“*City of God* reveals that a vast number of Brazilians speak a language that differs from educated Portuguese and is unknown to the upper classes. It is an agile, precise, synthetic, and quick-fire language that’s highly expressive of contemporary Brazil,” Nagib explained.

The language spoken in the film, she said, also contains many alliterations, consonants, and poetic tendencies. Words are not only used to convey onscreen dialogue, but certain terms also have symbolic meanings and associations.

For example, Nagib pointed to the use of the term “rapá”—a shortened version of the word “rapaz” (boy) that’s derived from a Latin term to describe “a person who steals.”

According to Nagib, intersemiotic translation also shaped many aspects of *City of God*’s onscreen performances, cinematography, editing, and dialogue.

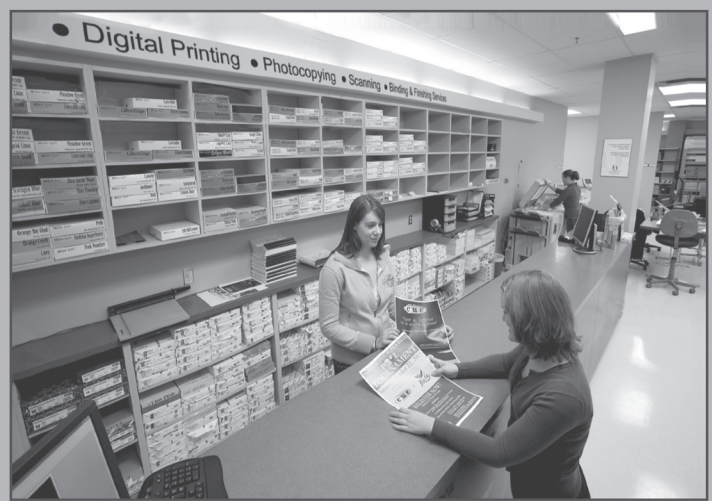
“Radical changes were made to the script, the dialogues, and the performances, all with the intention of ‘naturalizing’ what is believed to be the ‘reality’ of the favela,” Nagib said.

But while *City of God* may depict a brutal image, Nagib credits the authorship of the film for depicting the plight and reality of Brazil’s poor.

“The extreme skill in the use of linguistic devices in the novel and cinematic techniques in the film is directed towards avoiding an interruption of the utopia that would put an end to history,” Nagib concluded.

—Edmon Rotea, News Staff

Students’ Union Print Centre



FAST and AFFORDABLE service on campus!

full service | no disk fees | free hole punching at time of printing | binding services available

Black & White Copying Standard Sheetfed			Black & White Digital Printing			Full Colour Digital Printing or Copying		
PAPER SIZE	SINGLE SIDED	DOUBLE SIDED	PAPER SIZE	SINGLE SIDED	DOUBLE SIDED	PAPER SIZE	SINGLE SIDED (as low as)	DOUBLE SIDED (as low as)
8.5x11	5¢	9¢	8.5x11	8¢	15¢	8.5x11	49¢*	90¢*
8.5x14	7¢	12¢	8.5x14	10¢	19¢	8.5x14	69¢*	\$1.30*
11x17	10¢	15¢	11x17	12¢	23¢	11x17	79¢*	\$1.50*

Over 99 digital copies are charged at copying prices *Quantity discounts apply

We’re right where you need us.
Students' Union Building,
021 Lower Level
Monday to Friday 9:00 AM - 5:00 PM
492-9113 | email print jobs to printcentre@su.ualberta.ca

YOUR 2008/2009 STUDENTS’ UNION EXECUTIVE

PRESIDENT
JANELLE MORIN

VICE PRESIDENT (ACADEMIC)
JOHN BRAGA

VICE PRESIDENT (EXTERNAL)
BEVERLY EASTHAM

**VICE PRESIDENT
(OPERATIONS & FINANCE))**
STEVEN DOLLANSKY

VICE PRESIDENT (STUDENT LIFE)
KRISTEN FLATH

BOARD OF GOVERNORS REP
MICHAEL JANZ

**Vote for your Students’ Council
and GFC Councillors on**
MARCH 19 & 20

