Montreal-born pianist, Oscar Peterson, performs with the Montreal Symphony

A Contrasts series includes James (Blood) Ulmer and his brand of harmelodic rock, Bruce Cockburn, reggae from Oliver Lake's Jump Up, salsa from the Ray Baretto orchestra and blues from Cotton, John Mayall and Paul Butterfield.

The festival will also include a series of jazz films.

Jazz competitions

Free concerts, apart from the outdoor concerts, include a competition among new Quebec jazz groups and a series of concerts by established local groups at the nearby University of Quebec.

Added features this year include a concert at the Forum, home of the Montreal Canadiens, where Montreal-born pianist Oscar Peterson and French violinist Jean-Luc Ponty will join the Montreal Symphony Orchestra under its conductor, Charles Dutoit, to play works by Gershwin and the Leonard Bernstein score from *West side Story*, which Peterson has recorded.

Radio-Canada will also broadcast a tribute to French jazz featuring, among others, singer Claude Nougaro and pianist Martial Solal. The Festival's closing concert, to be televised live on *Les Beaux Dimanches*, will be titled "A Tribute to French Jazz."

Katie Malloch, host of CBC-FM's *Jazz Beat*, will present a seven-hour live broadcast from the festival on July 6.

At the nearby Spectrum Theatre, a Jazz Beat series has been drawn up in consultation with CBC-FM producer Alain de Grosbois for broadcast next season on his weekly program of the same name.

Artists include vocalists Bobby McFerrin and Tania Maria, saxophonists Sonny Rollins, Richie Cole and Leandro (Gato) Barbieri, vibraphonist Gary Burton, French violinist Stephane Grappelli and the Heath Brothers — drummer Albert, tenor sax Jimmy, and bassist Percy.

A Pianissimo series, also to be broadcast in part on CBC's *Jazz Beat*, has solo piano concerts by Americans Kenny Barron, Ahmad Jamal, Lyle Mays, Joanne Brackeen and Sir Roland Hana, Martial Solal and Michel Petrucciani of France, former Montrealer Paul Bley and expatriate American Oliver Jones, who lives and works in Montreal.

Seeing-eye robots

A psychology professor at Memorial University in St. John's, Newfoundland, has designed an eye for a robot that can see like a human eye and will be less expensive and more efficient than any existing system.

What makes the human eye different from most robot vision systems is that it is almost constantly moving. As the eye moves over a scene, from point to point, it pauses to look for one-tenth of a second and then moves on.

"In actual manufacturing plants," professor Michael Zagorski said, "the average worker can look over an assembly line, and during one fixation, one-tenth of a second, pick out the correct part."

Researchers are fairly certain a human eye does not take in every detail of a scene in one such glance, he said. What it does see are shapes. The robot system designed by Dr. Zagorski can recognize shapes but does not waste time filling in the whole picture.

"The system I have takes into account explicitly what the human eye can do," he said, "but also explicitly what the human eye cannot do."

Certain jobs

Robots are already doing certain visual jobs, such as inspecting objects for cracks, far better than people ever could. But no one has yet developed a low-priced system capable of rapidly doing simple visual tasks that any unskilled human can do, such as distinguishing between a connecting rod and a crankcase cover.

Dr. Zagorski said his system would be limited to locating and recognizing objects a human can locate and recognize at a glance.

"This would be useful in applications where the robotic system is being explicitly designed to replace people where they have to recognize objects on, say, a well-lit assembly line." Existing systems do not have a simple and fast way of describing non-geometric shapes.

"We can describe shape by describing all the points," Dr. Zagorski said, "so that we have a video display that has a resolution of 1 000 by 1 000. Then we can describe the shape, if it's black on white, or white on black, by just listing 1 000 times 1 000 points."

But this is complicated, costly and time-consuming — and unnecessary for simple tasks, Dr. Zagorski said. He believes the solution to the problem of defining shape, like the problem of defining colour, is to be found in copying human visual processes.

Three colour receptors

Psychologists have discovered that the eye has three colour receptors — one for each primary colour. Hence, colour can be defined in three numbers — one each for red, green and blue.

By means of a mathematical model he developed in 1975, Dr. Zagorski said he can analyze complex shape images into 20 dimensions. He would not disclose the technique because his patent search is not completed.

Using 20 numbers to calculate an outline would involve well under 1 000 multiplications, Dr. Zagorski said. This means the shape analysis could be done instantly on a computer.