# Research exchange projects

## Uruguay

### Shared platform for radiation-free paediatric scoliosis monitoring

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Scoliosis affects approximately 1 in 1,000 individuals, causing severe spinal deformity in about 10% of the cases. Spontaneously arising, idiopathic, scoliosis makes up about 90% of the cases. Scoliosis is usually discovered in adolescents and the disease progresses until the spine reaches full development. It is imperative to monitor the progress of scoliosis so that the appropriate therapy can be determined: monitoring, conservative correction like bracing, or surgery. Surgery is usually delayed until full development.

Scoliosis is found in both boys and girls, but a girl’s spinal curve is much more likely to progress and eventually girls require scoliosis treatment about five times more often than boys. Typically, a patient is monitored for over a decade, two to four times per year. Standard progression monitoring method is bilateral X-ray examination, exposing the child to a significant amount of harmful cumulative radiation over the years.

In girls with scoliosis, regular X-ray examinations are positively linked to an increased risk of breast cancer. Repeated X-ray examination in childhood causes a twofold increase of the risk of leukemia in both sexes and of prostate cancer in males. Several other types of cancer are also suspected to be linked with excessive cumulative radiation during childhood. By developing a system for ultrasound image-based paediatric scoliosis monitoring we expect to achieve safe and radiation-free monitoring of the progress of scoliosis.

The objective of this collaboration is to develop a shared prototype system and platform for paediatric scoliosis monitoring, by measuring spinal curvature in three dimensions from ultrasound images, thus achieving safe and radiation-free monitoring of the progression of disease. The researchers’ long-term goal, beyond the extent of this LACREG grant, is to develop an inexpensive system using pocket ultrasound and webcam tracking, suitable for wide-scale clinical dissemination, especially in Latin American and Caribbean countries and underserved communities.

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