Neotopsy: Micro-CT angiography for the virtual autopsy of fetuses, newborns and infants

Project nr.: CTI 28314.1 PFLS-LS - 1
Main Applicant: Empa, Robert Zboray (contact: robert.zboray@empa.ch)
Research Partners: IRM UZH, Wolf Schweitzer, Lars Ebert
Klinik für Neonatologie, USZ, Martin Wolf, Christoph Rüegger, Sabino Guglielmini
Industrial Partner: SCANCO Medical AG, Bruno Koller, Stephan Weiss, Stefan Hämmerle
**Starting date :** 05.11.2018**; Duration:** 48 month

Project goals

Autopsy rates for infants are declining, whereas, the information gained through autopsy might help to get a better understanding of sudden infant death. One way of increasing the acceptance of autopsy for neonates is the use **virtual autopsy** by Post-mortem Computed Tomography (PMCT) imaging. Clinical CT scanners lack spatial resolution to visualize small features in neonates. We develop in this project a **micro-CT scanner** for neonates utilizing **dual-energy angiography** technique to focus on malformations in the cardiovascular system.

Scientific Innovation

- Dual-energy PMCT angiography micro-CT scanner (~30 um) with optimized image quality for forensic investigation for neonates
- Database with classified 3D micro-CT images of deceased fetuses, preterm and term infant
- Feature extraction (texture/shape, intensity) for different classes of malformations from above database for machine learning
- Develop and train efficient machine learning algorithms
- Testing the feasibility and application on a set of real forensic images and simulated malformations
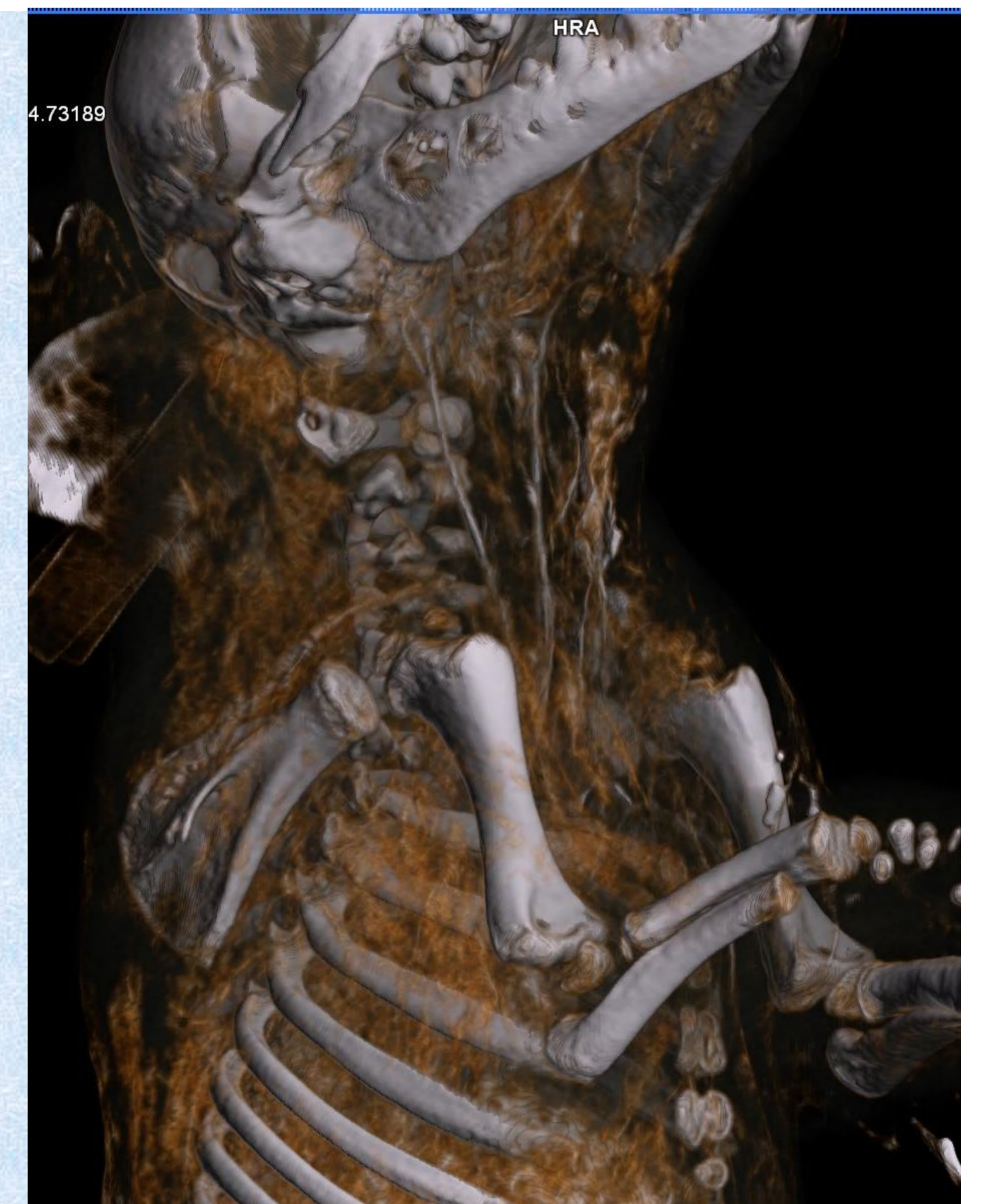
Business Potential

- Currently no commercial device like this is available
- Targeted costumers: perinatal centers
- 10 such centers in Switzerland, >300 in Europe
- Market leader position

Acknowledgements