



## Séminaire conjoint CIRRELT et La Chaire de recherche du Canada en logistique intégrée



Chaire de recherche du Canada  
en logistique intégrée

**Ettore Lanzarone**  
National Research Council of Italy



### A BLOOD DONATION APPOINTMENT SCHEDULING

LUNDI

11 février 2019  
10 h 00

Local 1307  
Pavillon Palasis-Prince  
Université Laval

Ouvert à tous

Café et viennoiseries

**Organisateurs:**  
*Leandro Coelho / Angel Ruiz*

**Abstract:** Blood is fundamental in several care treatments and surgeries, and plays a crucial role in the health care system. It is a limited resource, as it can be produced only by donors and its shelf life is short; thus, the blood donation (BD) system aims at providing adequate supply of blood units to transfusion centers and hospitals. An effective collection of blood units from donors is fundamental for adequately feeding the entire BD system and optimizing blood usage. However, despite its relevance, donation scheduling is only marginally addressed in the literature. In this paper we consider the Blood Donation Appointment Scheduling (BDAS) problem, aiming at balancing the production of the different blood types among days in order to provide a quite constant feeding of blood units to the BD system. We propose a framework for the appointment reservation that accounts for both booked donors and donors arriving without a reservation. It consists of an offline Mixed Integer Linear Programming (MILP) model for preallocating time slots to blood types, and an online prioritization policy to assign a preallocated slot when the donor calls to make the reservation. A deterministic version of the MILP has been already proposed and validated, while we are currently working on two robust and stochastic extensions to deal with the uncertain arrivals of donors.

**Biography:** Ettore Lanzarone was born in Milan, Italy, in 1979. He obtained his Ph.D. in bioengineering in June 2008 and his master degree in biomedical engineering cum laude in April 2004 at Politecnico di Milano, Milan, Italy. Since November 2011 he is permanent researcher at the Institute of Applied Mathematics and Information Technology (IMATI) of the National Research Council of Italy (CNR), Milan, Italy. Previously, he was a research fellow at the Department of Mechanics of Politecnico di Milano, Milan, Italy. He is Adjunct Professor at the Politecnico di Milano, Milan, Italy, and the University of Bergamo, Bergamo, Italy. He is collaborating member of the CIRRELT and member of the Beta-Lab (Laboratory of Biomechanics for Endovascular Treatments of the Aorta), Università degli Studi di Pavia, CNR-IMATI and Policlinico San Donato. His research activities deal with optimization and operations research, stochastic models, and bioengineering applications. More details at [www.ettorelanzarone.it](http://www.ettorelanzarone.it)

