



Séminaire des étudiants du CIRRELT Students Seminar*

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OPTIMIZATION IN RADIATION THERAPY TREATMENT PLANNING

ABSTRACT: Radiation therapy is one of the most important cancer treatment methods, which about 50% of patients receive during their illness. The treatment should be performed in such a way that it maximizes the dose of radiation to tumors, while simultaneously minimizes the adverse effects of radiations to healthy tissues. Recently, optimization techniques have been used to determine where and how much radiation should be delivered to patient's body.

In this talk, first, I will discuss the basic problems in this area and then focus on a novel form of the external radiotherapy called volumetric modulated arc therapy (VMAT). This technology gives us the ability of changing the beam shape, the rotation speed, and the dose rate continuously and dynamically during rotation around the patient. Thus, the treatment planning in this problem consists of: (1) selecting a delivery sequence of beam shapes, and (2) determining the optimal dose rate, i.e., intensity, and rotation speed of the beam radiation. We discuss the advantages of two main optimization approaches in the literature, a column-generation based heuristic and a two-phase mathematical model. Finally, we briefly present a part of our model that contributes to this area and some promising research opportunities.

Note : Mehdi Mahnam (Mehdi.Mahnam@cirrelt.ca) est lauréat d'une prestigieuse bourse d'études supérieures du Canada Vanier. / Mehdi Mahnam is recipient of a prestigious Vanier Canada Graduate Scholarship.

VENDREDI / FRIDAY

**23 janvier 2015, à 12h
January 23rd, 2014, at 12:00**

**Salle / Room 5441
Pavillon André-Aisenstadt
Université de Montréal**

Pizza et boisson gazeuse fournies

Pizza and soft drink offered

Réservé aux membres du CIRRELT

Inscription obligatoire au plus tard le 22 janvier / Registration required no later than January 22

<https://symposia.cirrelt.ca/Sem-Etudiants/fr/register>

*** Étudiants de 2^e et 3^e cycle intéressés à présenter / Graduate students interested in presenting : Antoine.Legrain@cirrelt.ca**



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