

## Accepted Manuscript

General sum games with joint chance constraints

Shen Peng, Vikas Vikram Singh, Abdel Lisser

PII: S0167-6377(17)30241-9  
DOI: <https://doi.org/10.1016/j.orl.2018.07.003>  
Reference: OPERES 6379

To appear in: *Operations Research Letters*

Received date: 21 April 2017  
Revised date: 9 July 2018  
Accepted date: 11 July 2018



Please cite this article as: S. Peng, V.V. Singh, A. Lisser, General sum games with joint chance constraints, *Operations Research Letters* (2018), <https://doi.org/10.1016/j.orl.2018.07.003>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# General sum games with joint chance constraints

Shen Peng<sup>a,b</sup>, Vikas Vikram Singh<sup>c</sup>, Abdel Lisser<sup>b</sup>

<sup>a</sup>*School of Mathematics and Statistics, Xi'an Jiaotong University, Xi'an, Shaanxi, 710049, P. R. China*

<sup>b</sup>*Laboratoire de Recherche en Informatique (LRI), Université Paris Sud - XI, Bât. 650, 91405 Orsay Cedex, France*

<sup>c</sup>*Department of Mathematics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, 110016, India.*

---

## Abstract

We consider an  $n$ -player non-cooperative game with continuous strategy sets. The strategy set of each player contains a set of stochastic linear constraints. We model the stochastic linear constraints of each player as a joint chance constraint. We assume that the row vectors of a matrix defining the stochastic constraints of each player are independent and each row vector follows a multivariate normal distribution. Under certain conditions, we show the existence of a Nash equilibrium for this game.

*Keywords:* Chance-constrained game, Multivariate normal distribution, Nash equilibrium.

---

## 1. Introduction

The notion of the Nash equilibrium was introduced by John Nash in 1950 [20]. He showed that there exists a mixed strategy Nash equilibrium for an  $n$ -player finite strategic game. The games with continuous strategy sets have also been extensively studied in the literature. A Nash equilibrium in this case exists under certain conditions on the players' strategy sets and payoff functions [1]. The games considered in [1, 20] are deterministic in nature, i.e., the payoff function and strategy set of each player are deterministic. However, there could

---

*Email addresses:* peng@lri.fr (Shen Peng), vikassingh@iitd.ac.in (Shen Peng), abdel.lisser@lri.fr (Abdel Lisser)

Download English Version:

<https://daneshyari.com/en/article/7543717>

Download Persian Version:

<https://daneshyari.com/article/7543717>

[Daneshyari.com](https://daneshyari.com)