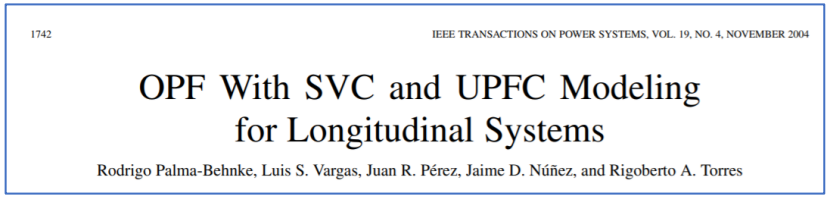
Diseño de redes logísticas considerando preferencia de usuarios

JUAN PÉREZ

Presentación y contexto

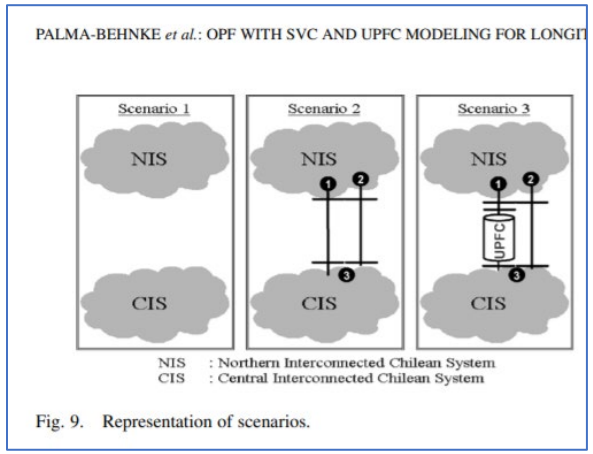
- Sobre la invitación a participar y brevemente mi background
  - Redes de potencia
  - Redes de telecomunicaciones



1742 IEEE TRANSACTIONS ON POWER SYSTEMS, VOL. 19, NO. 4, NOVEMBER 2004

OPF With SVC and UPFC Modeling for Longitudinal Systems

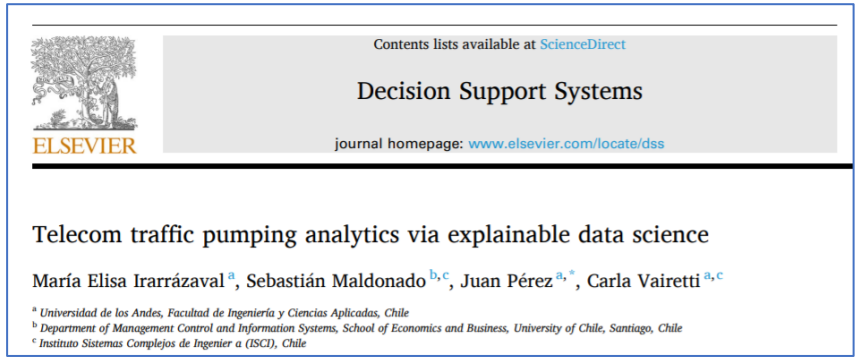
Rodrigo Palma-Behnke, Luis S. Vargas, Juan R. Pérez, Jaime D. Núñez, and Rigoberto A. Torres



PALMA-BEHNKE *et al.*: OPF WITH SVC AND UPFC MODELING FOR LONGIT

NIS : Northern Interconnected Chilean System
CIS : Central Interconnected Chilean System

Fig. 9. Representation of scenarios.



Contents lists available at ScienceDirect

Decision Support Systems

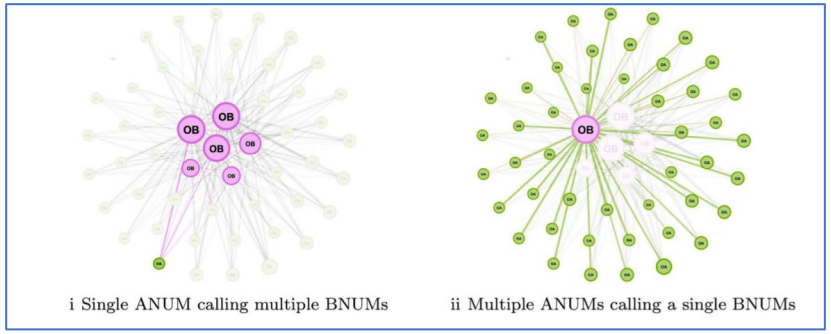
journal homepage: www.elsevier.com/locate/dss

ELSEVIER

Telecom traffic pumping analytics via explainable data science

María Elisa Irarrázaval [a], Sebastián Maldonado [b,c], Juan Pérez [a,*], Carla Vairetti [a,c]

[a] Universidad de los Andes, Facultad de Ingeniería y Ciencias Aplicadas, Chile
[b] Department of Management Control and Information Systems, School of Economics and Business, University of Chile, Santiago, Chile
[c] Instituto Sistemas Complejos de Ingenier a (ISCI), Chile



i Single ANUM calling multiple BNUMs ii Multiple ANUMs calling a single BNUMs

Motivación del tema

- Relevancia de la inclusión de las preferencias de los usuarios en el diseño de redes
- Rol de los modelos de elección discreta y el enfoque que incide en la estructura de las redes

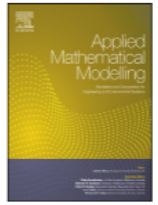
Casos – Retail Store Location

Applied Mathematical Modelling 75 (2019) 521–534

Contents lists available at ScienceDirect

Applied Mathematical Modelling

journal homepage: www.elsevier.com/locate/apm



Retail store location and pricing within a competitive environment using constrained multinomial logit

Gabriel Zambrano-Rey[a], Héctor López-Ospina[b], Juan Pérez[c,*]

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[b] Universidad del Norte, Barranquilla, Colombia
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Keywords:
Pricing
Constrained multinomial logit
Location models
Consumer choice models

ABSTRACT

The purpose of this paper is to report a pricing and retail location model using the constrained multinomial logit (CMNL), which takes into account customers' utility and maximum willingness to pay via cut-off soft-constraints. The proposed model is probabilistic and non-linear, therefore a PSO metaheuristic approach was designed to determine the most suitable price, store locations and demand segmentation. The results obtained in test-cases showed a close relationship between price and location decisions. In addition, the results suggest that not only price, but also location decisions are affected when the consumers' maximum willingness to pay is considered.

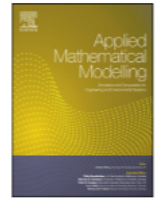
Casos – Sistema Atención de Salud Colombia

Applied Mathematical Modelling 89 (2021) 428–453

Contents lists available at ScienceDirect

Applied Mathematical Modelling

journal homepage: www.elsevier.com/locate/apm



Design of a location and transportation optimization model including quality of service using constrained multinomial logit

Héctor López-Ospina[a], Ángela Agudelo-Bernal[b], Lina Reyes-Muñoz[b], Gabriel Zambrano-Rey[b], Juan Pérez[c,*]

[a] Universidad del Norte, Barranquilla, Colombia
[b] Industrial Engineering Department, Pontificia Universidad Javeriana, Cra 7 #40-62, Ed. Jose Gabriel Maldonado P.3, Bogotá, Colombia
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Transportation-Location model
Discrete choice models
Constrained multinomial logit (CMNL)
Quality of service

ABSTRACT

The design of an integrated network with decisions about tactical transportation and strategic locations is complicated and challenging. In addition to the need to consider cost issues, the consumers' preferences will also have a significant impact on the resulting network. We propose an integrated transportation and location optimization model for designing logistic networks. Our model uses a hybrid iterative heuristic based on a genetic algorithm and a constrained multinomial logit, which includes consumers' preferences and quality of service variables. Our results show relevant differences when considering, along with network costs, parameters related to the consumers: travel distance, congestion, waiting time, and service time.

Casos – No solo redes / Pricing

International Journal of Production Research, 2016
Vol. 54, No. 13, 3994–4007, http://dx.doi.org/10.1080/00207543.2016.1170905

Pricing and composition of bundles with constrained multinomial logit

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[a]*Facultad de Ingeniería y Ciencias Aplicadas, Universidad de los Andes, Santiago, Chile;* [b]*Industrial Engineering Department, Pontificia Universidad Javeriana, Bogotá, Colombia;* [c]*School of Engineering, Pontificia Universidad Católica de Chile, Santiago, Chile*

(*Received 7 July 2015; accepted 20 March 2016*)

In this paper, we propose an extension of the problem of bundling with multinomial logit, making an explicit inclusion of the consumers' maximum willingness to pay (MWTP) by means of the constrained multinomial logit (CMNL). In the bundling problem, we determine the price and the composition of bundles offered for a single segment of consumers by a firm, which is competing with others in the market, and we compare this result to a base case in which the consumers' MWTP is not considered. We assume these consumers as rational since they choose the bundle that maximise their utility and the bundle price is within their MWTP. The resulting model is a non-linear mixed integer programme which is solved in two steps: (i) pricing is the first step; the prices are numerically determined in a fixed point equations system and (ii) in the second step the composition of the bundle is determined by explicit enumeration. The results show that the price obtained is less than the one got in the case without CMNL (and bigger than the costs), and the composition of the offered bundle is different as well. It is possible to conclude that not considering the consumers' MWTP in the context of the problem of bundling will imply an overestimation of the firm's profit. We have analysed as well the results for a Chilean telecommunications company. These results show the importance of including the MWTP in the pricing and composition process.

Keywords: pricing; constrained multinomial logit; bundle composition; consumer choice models

Casos – No solo redes / Assortment

European Journal of Operational Research 293 (2021) 1168–1187

Contents lists available at ScienceDirect

European Journal of Operational Research

journal homepage: www.elsevier.com/locate/ejor

Optimal bundle composition in competition for continuous attributes

Kenneth Page[a], Juan Pérez[a,*], Claudio Telha[a], Andrés García-Echalar[a], Héctor López-Ospina[b]

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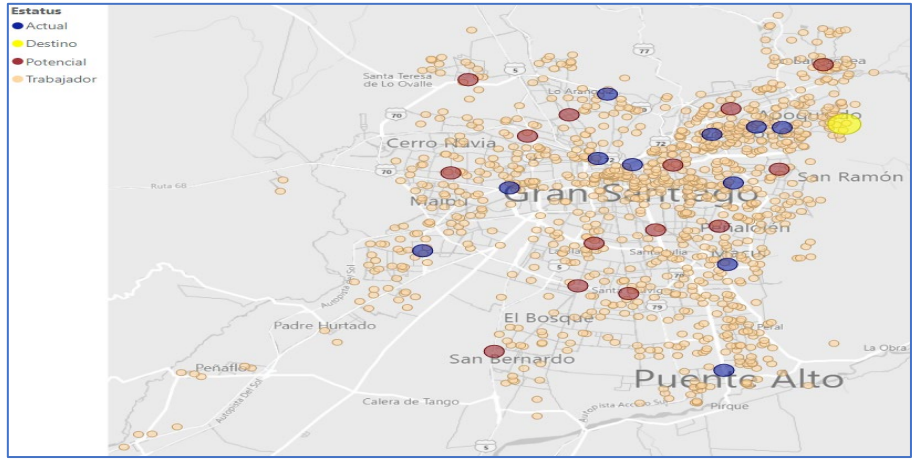
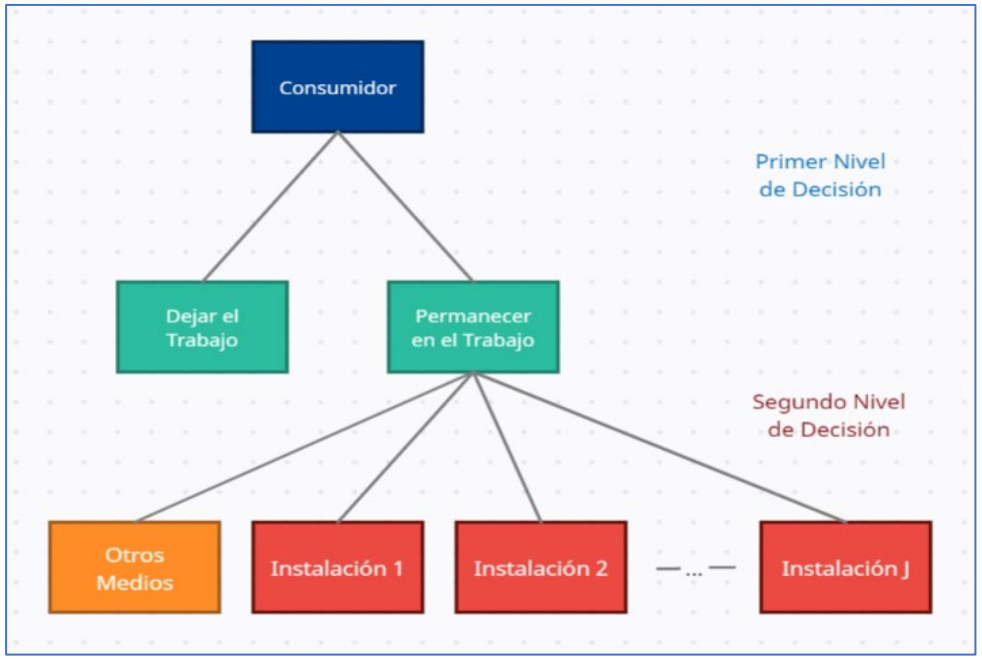
Bundling
Optimal composition
Constrained multinomial logit
Competition
Independence of irrelevant alternatives

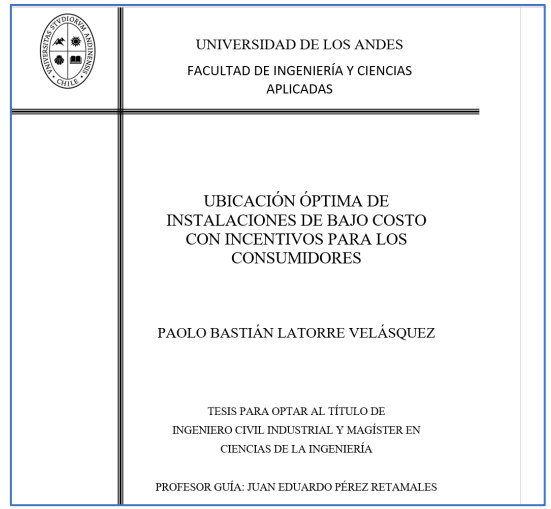
ABSTRACT

We propose a model to design bundles' composition under competition, quantifying its effect in terms of profit and market share in a game among competing firms. According to our literature review, no previous models on optimal bundle composition can handle the competition as we do in this paper. Besides, we explain how a firm designing multiple bundles with equal price obtains a replication of identical bundles and an artificially increased estimation of the firm's profit and market share, which is a consequence of the well-known Independence of Irrelevant Alternatives Property. To mitigate this effect, we use the Constrained Multinomial Logit Model, which induces differentiation in composition through soft constraints that represent the minimum quantity of the attributes offered in bundles. Although this methodology helps, its use implies more effort to estimate its parameters; nevertheless, these are feasible to be assessed. Firms can use our model to identify the bundles in which they should focus their commercial efforts, given the characteristics of their consumers.

Casos
Trabajo “en curso” – Caso Clínica UAndes







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UBICACIÓN ÓPTIMA DE INSTALACIONES DE BAJO COSTO CON INCENTIVOS PARA LOS CONSUMIDORES

PAOLO BASTIÁN LATORRE VELÁSQUEZ

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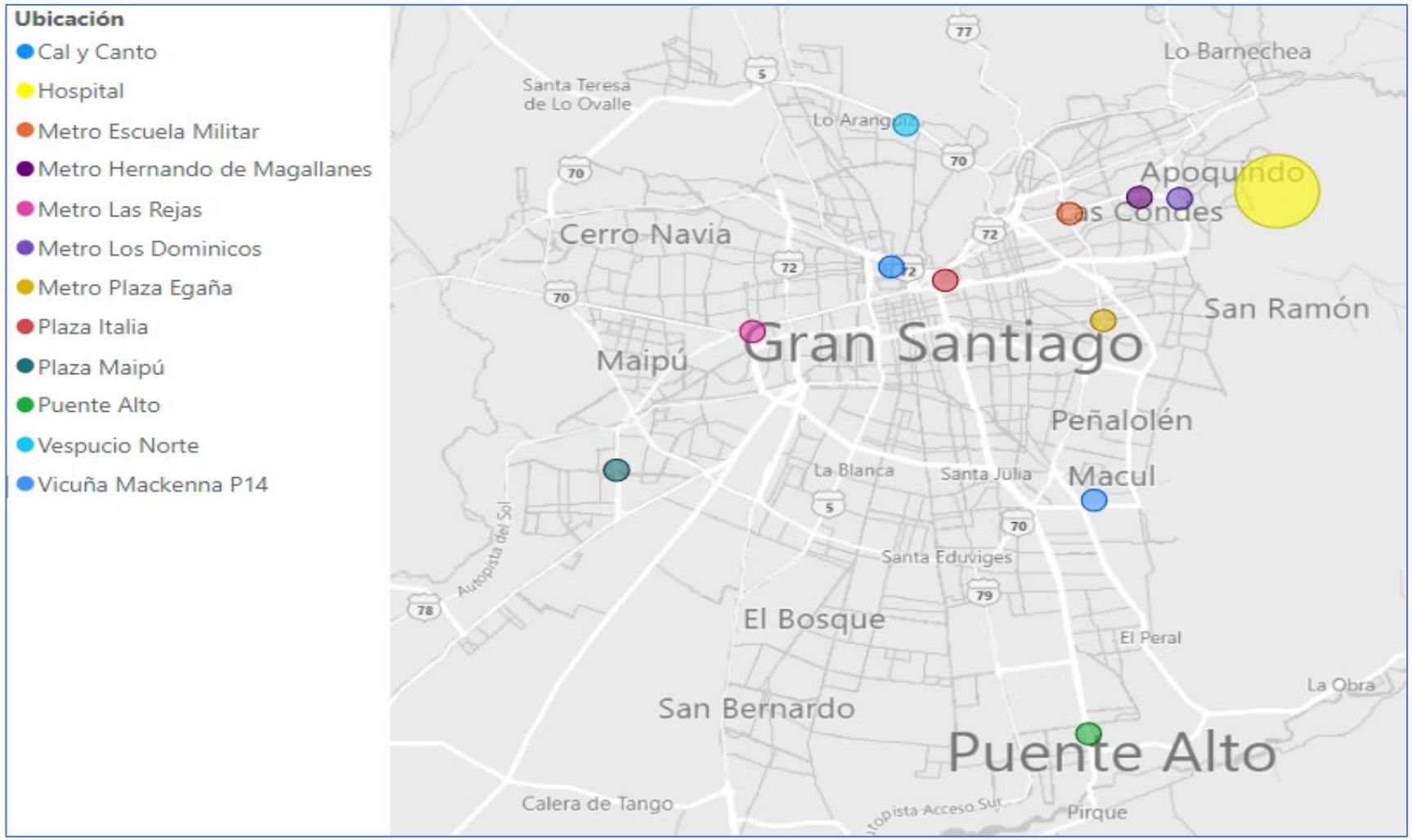
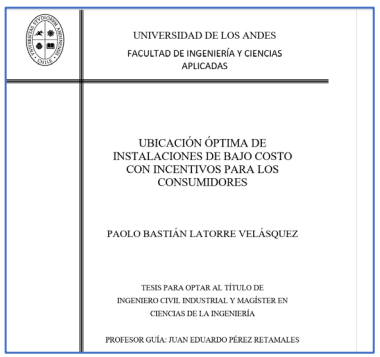
PROFESOR GUÍA: JUAN EDUARDO PÉREZ RETAMALES

Casos
Trabajo “en curso” – Caso Clínica UAndes





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Comentarios finales

- Relevancia de las preferencias de los usuarios
- Impacto en el diseño
  - Redes
  - Precios
  - Productos
- Desafíos
  - Trade-off: Mejor explicación vs Mejor predicción. Uso de otros modelos del mundo de Prescriptive Analytics.
  - Análisis de la dinámica de negocios → Matemáticamente se convierten en problemas de control discreto.
- Conclusión: las lecciones, experiencias y desarrollo de modelos de transporte tienen gran utilidad, impacto y proyecciones en entornos generales, no necesariamente sólo en transporte.