



HAL
open science

Solution of the odometric model by the hypergeometric function

Edern Ollivier

► **To cite this version:**

Edern Ollivier. Solution of the odometric model by the hypergeometric function. 2021. hal-03276644v1

HAL Id: hal-03276644

<https://hal.science/hal-03276644v1>

Preprint submitted on 2 Jul 2021 (v1), last revised 4 Aug 2021 (v2)

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Solution of the odometric model by the hypergeometric function

Edern Ollivier, *Member, IEEE*

edern.ollivier.fr@ieee.org

17 RUE DE L'AMIRAL HAMELIN at Paris 16 (75116)

Abstract—The odometric model is resolved herein. We have been starting to simulate, integrate, explain and then to validate the odometric model. The model of resolution is to be programmed in the Maple language, with the help of a solver for Maple 2021.

Index Terms—Odometry; Vehicle location and navigation systems; Mobile positioning systems; Trajectory; Discretization of a model; Control of a vehicle; Resolution analysis.

I. INTRODUCTION

As one introduction, I could say that the odometric model is well known now and that everything is shaped for the solution to be executed under Maple 2021.

This platform of solution has been developed by the Maplesoft with Mister Nicolas Cottereau and then is intensively and fluently used by myself for developing the mathematical framework of the solution of the odometric model.

II. EQUATIONS

The equations are given by the article “Simulation of the odometric model for the purpose of the numerical analysis” as given by [1].

III. SOLUTION

I have been using the complex formulation of the solution by adding the hypergeometric function, it is because of the negative logarithm to be involved in the solution of the equations of the odometric model.

IV. CONCLUSION

As one conclusion, I could say that the odometric model is well known now and that everything is done for the solution of a model of automation to be resolved with the odometric model.

ACKNOWLEDGMENT

The computer where the resolution has been provided has got the Maple 2021 software for the resolutions to be executed.

I would like to thank the team of support of Maplesoft, leded by the CEO of Maplesoft.

I would also thank Mister Nicolas Cottereau for the support given with the Maplesoft products which are Maple and MapleSim.

I would also thank Mister Philippe Jacquet for the help given with the analytical resolution of the equations of the odometric model.

REFERENCES

- [1] **Edern Ollivier**. Simulation, integration and explanation of the odometric model for the purpose of the numerical analysis: A pool of trajectories for the engineers of the automation of the fair and automated vehicle. 2019. (hal-02162501v8) ;



Edern Ollivier was born in Paris XI, Paris, France in 1977. He received M.S. degrees in

automation from the ENSMM, Besançon, in 2001 and the M.S. degrees in computer engineering from the FH of Karlsruhe, Karlsruhe, Germany, in 2001.

From 2001 to 2004, he was an Expert Engineer with the Inria of Rocquencourt. His research interests include the development of the Cybercars, SLAM, EKF and Front End Electronics.