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# Solution of the odometric model by the hypergeometric function

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**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 Cottureau 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, 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.” 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. RESOLUTION

The resolution has been provided as numerical by the support of Maple 2021, I have been doing the same resolution in “Validation 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.” as given by [2].

## V. 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, led by the CEO of Maplesoft.

I would also thank Mister Nicolas Cottureau 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] **Ederne 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-02162501v10) ;
- [2] **Ederne Ollivier**. Validation 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. 2020. (hal-02977289v4) ;



**Ederne 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.

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