

BACHELOR PROJECT ASSIGNMENT

Student: Pavel T r u t m a n

Study programme: Cybernetics and Robotics

Specialisation: Robotics

Title of Bachelor Project: Minimal Problem Solver Generator

Guidelines:

1. Review the state of the art in solving the polynomial systems using linear algebra [1, 2] and the automatic generator of the polynomial solvers [3, 4].
2. Implement the improvement [4] of [3] into the existing automatic generator of solvers.
3. Implement a variation of algorithm [1], review its behavior, and suggest how to take over some of its elements to the automatic generator and implement it.
4. Demonstrate the functionality of the new solver generator and compare it with the original solver.

Bibliography/Sources:

- [1] Faugere, J.-C. (June 1999): "A new efficient algorithm for computing Gröbner bases (F4)". Journal of Pure and Applied Algebra (Elsevier Science) 139 (1): 61–88.
doi:10.1016/S0022-4049(99)00005-5. ISSN 0022-4049.
- [2] Faugere, J.-C. (July 2002): "A new efficient algorithm for computing Gröbner bases without reduction to zero (F5)". Proceedings of the 2002 international symposium on Symbolic and algebraic computation (ISSAC) (ACM Press): 75–83.
- [3] Kukulova, Z.: Algebraic Methods in Computer Vision. PhD Thesis. CTU in Prague 2013.
<http://cmp.felk.cvut.cz/~kukulova/webthesis/docs/Kukulova-phd-2013.pdf>
- [4] Kukulova, Z.; Bujnak, M.; Heller, J.; Pajdla, T.: Singly-Bordered Block-Diagonal Form for Minimal Problem Solvers. ACCV 2014.

Bachelor Project Supervisor: Ing. Tomáš Pajdla, Ph.D.

Valid until: the end of the summer semester of academic year 2015/2016

L.S.

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