



HAL
open science

Synoptic of the Research Activity (Updated version, Oct. 2007)

Christian Laugier

► **To cite this version:**

Christian Laugier. Synoptic of the Research Activity (Updated version, Oct. 2007). [0] INRIA Grenoble - Rhone-Alpes; LIG (Laboratoire informatique de Grenoble). 2007. hal-03091861

HAL Id: hal-03091861

<https://hal.inria.fr/hal-03091861>

Submitted on 31 Dec 2020

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.

Christian LAUGIER

Synoptic of the Research Activity (Updated version, Oct. 2007)

The research activity includes a thematic change in 1979 (from Computer Graphics to Robotics). It can roughly be divided into five main periods : “Computer Graphics and CAD” (1974-78), “Robot programming and simulation” (1979-85), “Motion Planning & CAD Robotics” (1986-95), “Motion autonomy & Dynamic Simulation” (1996-02), “Geometry and probability for motion and action” (since mid-2002). The last period represents a deep methodological and thematic change with the past research. This research activity covers three important aspects : theoretical developments, experimental validations using complex experimental setups (various robots, sensors, and automatic vehicles), and valorization (start-ups, technological transfers, and various industrial partnerships).

Period 1 : Computer Graphics & CAD.

The work achieved during this first period was focused onto the study of graphical representations and of graphic interactions. It has mainly lead to the achievement of a Doctorate Thesis (French PhD) on graphical representations [14], and to some original results on the automatic interpretation of 2D hand drawings [226] and on the graphical visualization of 3D objects [289]; it has also given rise to the implementation of two graphical softwares (*GRIGRI* [292, 296] and *LISP3D* [287]), which have widely been used during several years at the IMAG Laboratory in Grenoble and at the CAD center of the MICADO company. The software *LISP3D* has been developed during the period of transition between the fields of Computer Graphics and of Robotics, and it included some new constructions for representing poly-articulated systems and robots (this characteristic was pretty original at this period where CAD-Robotics was just starting).

Period 2 : Robot Programming & Simulation.

The work during the second period was centered onto the study of the problems involved in *robot programming and in robot simulation* (in particular geometrical models and algorithms). During this period, I have actively participated to the creation of the ITMI company (1982) and of the GETRIS Images company (1985), and I have taken the leadership of the AI & Robotics research team of the LIFIA Laboratory (this research team was previously led by Jean-Claude Latombe until 1984). Two important scientific results have been obtained during this period : (1) *the development and the commercialization by the ITMI company of the LM system for robot programming* (my personal contribution being mainly centered onto the CAD and simulation functions) [219, 31, 247, 59, 58]; (2) *the principle of topologic/geometric analysis of quasi-static stability properties* for automatic grasping in Robotics. This approach for automated grasping, initially published in [224] and in [30], has been used as the basements for several works in our research team (in particular the PhD thesis of J. Pertin-Trocraz in 1985 and our pioneer work in the field of dexterous grasping); it has also inspired some works at the international level (for instance, T. Lozano-Perez from MIT has re-used the concept of “P-Convexity” and some contemporary developments at the university of Karlsruhe relies on this principle). Later on, this approach for automatic grasping has been extended in order to integrate sensing data and more complete motion planning techniques [52].

Period 3 : Motion Planning & CAD-Robotics.

The work done during the third period was mainly focused onto the concepts of *Motion Planning and of Geometric Reasoning*. This work is representative of my second Doctorate Thesis (French “Thèse d’Etat”) [13], which has been finalized during my stay at MIT in the summer 1989 under the supervision of Jean-Claude Latombe. This work, which includes the contributions of several PhD students having worked under my supervision, has given a strong “Automatic Robot Programming” identity to our research team (the main competitor on this topic was the team of Thomas Lozano-Perez at MIT AI Lab). The approach consists in formalizing the characteristics of the various motions to be planned (free space motions, grasping & stability, manipulation & uncertainty), and in trying to develop the most appropriate models and algorithms. This work has given rise to the implementation of a prototype system (the *SHARP* system [248]); it has also given rise, in conjunction with the work done by Emmanuel Mazer, to a technological transfer (the *ACT system* [200], commercialized by the *Aleph Technologies* company, and developed in collaboration with Bernard Faverjon from Inria Sophia-Antipolis). From the conceptual point of view, the most original part of this work relies in fact that we have developed a formalism and various algorithms for *explicitly taken into account the additional constraints coming from the physical world*, while trying to master the intrinsic algorithmic complexity of these problems (the algorithmic complexity being already of an exponential nature before considering these additional constraints) : uncertainty [54, 51], vision perception [24], wheel/ground interactions [55, 170, 161]. Our results in the field of CAD-Robotics have lead to the creation of the *Aleph Technology* company (1989), and our original approach for modeling the wheel-ground interactions in mobile robotics is at the origin of more recent developments at the SimTech Institute in Singapore.

Period 4 : Motion autonomy & Dynamic simulation.

This research period put the emphasis onto two important concepts for the development of Robotics : *Motion Autonomy and Dynamic Simulation*. Most of the work done in the field of Motion Autonomy has been performed in the context of the Automated Road application, by considering some new and important dimensions of the movement : kinematics, dynamics, and reactivity with respect to hazards inherent to the real world. Our approach, which has already been

tested on several real vehicles, consists in both developing the models and algorithms required for dealing with the above-mentioned constraints [191, 135, 236, 230], and in integrating these methods into a control architecture combining a decisional layer and a reactive layer using the new concept of “Sensor-Based Maneuver” [50, 18]. This work has allowed us to skip from traditional “academic geometric planners” to *motion planners having the capability to generate solutions which are executable on real vehicles* : e.g. planning continuous curvature paths with bounded derivatives in order to take into account the physical steering constraints of a car [135], the concept of “time-state” and more recently the concept of “Velocity-Obstacle” for taking into account the dynamic characteristics of the car and of the environment [191, 230], a real-time incremental planning paradigm for controlling the parking maneuvers of an autonomous vehicle [148]. This work has also given rise to numerous public demonstrations (exhibitions, TV shows, official events), and to two patents : a first one in 1997 on “car parking assistance” (with Igor Paromtchik) which has finally not been accepted because of an anterior publication of the work (it should be noticed that Toyota has commercialized in 2004 a product which seems to be based on the same philosophy) ; a second one on the use of the concept of “V-Obstacle for collision avoidance in a dynamic environment” (with Frederic Large, Sepanta Sekhavat, and Zvi Shiller).

During this period, we have also initiated a pioneer work on the new concept of *Dynamic Simulation for Robotics* (it was 10 years ago, at a time where almost nothing was done on this topic). This work was motivated by the fact that classical geometric models are not appropriate for dealing with some physical constraints of robotics tasks (e.g. wheel-ground interactions for off-road vehicles, object-finger interactions in dexterous manipulation of non necessarily rigid objects). Later on, our approach has been extended in order to be able to address simulation problems for medical applications. This work has mainly given rise to the development of models and algorithms for processing in an integrated way movements, deformations, and physical interactions (e.g. collisions and haptic interaction) [153, 19, 47, 43]. Two systems exhibiting such characteristics have been developed (*Robot ϕ* and *AlaDyn3D*), patented at APP (with Ammar Joukhadar and Anton Deguet), and used at various levels (internal use, Web, customized versions at the Orthopedic Institute of Bologna and at the Getris company). From the conceptual point of view, the main originality of our work relies at two layers : (1) the development of *efficient geometric algorithms* for processing 3D interactions (e.g. efficient collision detection between deformable objects [131], determination of fictive interpenetrations and of collision forces [122] (*finalist best paper award at ICARCV'00*) [49]), and (2) the development of *interactive “reality-based” simulation techniques* (identification of the model parameters from measures done on real bodies [140, 126], efficient models for simulating biological tissues using Mass-Spring Networks or Explicit Finite Elements [125, 126, 98] or using a new type of model — the *LEM* model (best paper at PUG'00) and the *VDM* model recently used in a knee arthroscopy application [46]— based on the Pascal principle and on the volume conservation principle [112, 231], haptic interaction with complex deformable bodies and simulation of some associated complex phenomena such as cutting or tearing [113, 111, 231, 98]. This approach has been used for implementing various medical simulators : “Liver surgery simulator” developed in cooperation with the Epidaure project at Inria Sophia-Antipolis and IRCAD institute in Strasbourg, “Echographic simulator” developed in cooperation with TIMC-Grenoble [43], “Knee AnteCross Ligament simulation” developed in cooperation with a surgeon at the Orthopedic Institute of Bologna, “Prototype assistance system for knee arthroscopic reconstruction” in cooperation with the Aeculap company [46]. This research axis has progressively been stopped during the period 2000-2004.

Period 5 : Geometry and Probability for motion and action.

This new period, which roughly starts at the beginning of the years 2000, represents a significative change in my research orientations. The main challenge we are addressing is to develop new models and approaches for achieving an old dream of Robotics researchers : “robots sharing the human living space”. This challenge has been first proposed in March 2002 during an European brainstorming meeting in Brussels ; this meeting has been organized during the preparation of the FET (Future Emerging Technology) call for projects “Beyond Robotics”. The research programme of my new research team (called *e-Motion* and officially created in 2004) relies on this challenge. From the scientific point of view, this challenge leads to deeply revisit the traditional approaches which are not fully adapted to the processing of uncertainty and complexity constraints coming from real world applications. Our research work is now based onto the combination of Geometric & Topological models with the Probabilistic models (concept of “*Bayesian Programming*”)¹. This approach is close to the one presented by Sebastian Thrun from Stanford University in his recent book and publications on “Probabilistic Robotics” ; it is also more and more popular in the Robotics community.

This new approach has led us to obtain some important scientific results showing the power of Bayesian models ; these results has been published in the main conferences and journals of the domain :

- Navigation in open and dynamic environments using a combination of SLAM (Simultaneous Localization and Mapping) and Motion Planning techniques [99, 101] [86, 84, 83, 85] [68, 67, 63].
- Bayesian modeling of sensory-motor reactive behaviors for safe navigation in partly structured environments [96, 45] [109, 44].
- Concepts of *NLVO* (Non-Linear Velocity Obstacles) [105, 108, 42] and of *PVO* (Probabilistic Velocity Obstacles) [65, 66] for safe navigation in dynamic environments.
- Concept of *GHMM* (Growing Hidden Markov Model) combined with a “learn and predict” approach, for predicting the most probable future movements of various moving obstacles observed using sensors [87, 93, 82, 34, 35, 36]. A paper describing this approach is presented in 2007 at the very selective conference ISRR (International Symposium on Robotics Research) [60].

¹ see for more details the activity reports of the *e-Motion* research team at : <http://emotion.inrialpes.fr>

– Concept of *BOF* (Bayesian Occupancy Filter) for robust analyzing of dynamic scenes² [100, 41, 39, 250, 40].

This new scientific approach has lead us to obtain important National and European research contracts, e.g. the European projects *BIBA* (Bayesian Inference and Brain Artefacts) coordinated by our team until 2005, the European project *BACS* (Bayesian Approach to Cognitive Systems) launched as a follow up of *BIBA* and coordinated by Roland Siegwart from ETHZ, and the European project *PreVent/Profusion* coordinated by Daimler Chrisler (where we are focusing on sensor fusion for Advanced Driving Assistance Systems). Our scientific results has also lead us to the signing of important R&D contracts with large companies in the field of automotive industry (e.g. TOYOTA and DENSO). All these industrial contracts are conducted in cooperation with our start-up company *Probayes*.

From the academic point of view, several workshops on these topics have successfully been organized since 2005 in the scope of the major international conferences IEEE ICRA and IEEE/RSJ IROS. These workshops about “navigation in dynamic environments” have involved several well known researchers and a significative number of participants (e.g. about 70 persons at the workshop orgnaized in Beijing in 2006). A recent book about “Autonomous navigation in dynamic environments” has been published in Springer STAR in July 2007 (C. Laugier and R. Chatila). An other book focusing on Bayesian approaches will be published very soon in Springer STAR (P. Bessiere, C. Laugier, R. Siegwart). Two special issues of the IEEE Transaction on Intelligent Transportation System and of the International Journal of Vehicle and Autonomous Systems will be soon published on these topics.

²Two patents based on this principle have been registered [304, 305] ; these patents are exploited in the scope of several collaboration contracts with industry (e.g. TOYOTA, DENSO, Probayes), for developing Advanced Driving Assistance Systems. The *BOF* software is integrated since 2006 in the Bayesian library *ProBT* commercialized by the *Probayes* company.

List of Publications

Theses & Books

- [1] C. LAUGIER, R. SIEGWART, A. MARTINELLI (Guest Editors), *Int. Jour. of Robotics Research (IJRR)*. Special issue on "Robots in Open and Dynamic Environments", Publication scheduled for Spring 2008.
- [2] C. LAUGIER, R. SIEGWART, C. PRADALIER (Guest Editors), *Int. Jour. of Field Robotics (IJFR)*. Special issue on "Field and Service Robotics", Publication scheduled for Spring 2008.
- [3] C. LAUGIER, U. NUMES (Guest Editors), *IEEE Trans. on Intelligent Transportation Systems (IEEE-ITS)*. Special issue on "Autonomous Intelligent Vehicle : Perception and Navigation", Publication scheduled for September 2008.
- [4] P. BESSIERE, C. LAUGIER AND R. SIEGWART (Guest Editors), *Springer Tracts in Advanced Robotics (STAR)*, "Bayesian Approaches to Cognitive Systems", Springer-Verlag, Publication scheduled for January 2008.
- [5] D. WANG AND C. LAUGIER (Guest Editors), *Int. Jour. of Vehicle Autonomous Systems (IJVAS)*. Special issue on "Advances in Autonomous Vehicle Technologies", Publication scheduled for December 2007.
- [6] C. LAUGIER AND R. CHATILA (Guest Editors), *Springer Tracts in Advanced Robotics (STAR)*, "Autonomous navigation in dynamic environments", Springer-Verlag, July 2007.
- [7] C. LAUGIER AND R. SIEGWART (Guest Editors), *Journal of Advanced Robotics*. Special issue on Intelligent Robots and Systems, Vol. 17, No. 7, August 2003.
- [8] C. LAUGIER (Guest Editor), *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, Inria, 1997.
- [9] J. DE SHUTTER, A. BLAKE, C. LAUGIER (Guest Editors), *Int. Jour. of Robotics Research (IJRR)*. Special issue on "Integration among planning, sensing and control", 14 (5), Sage Press, October 1995.
- [10] C. LAUGIER, J.-P. LAUMOND, C. SAMSON (Guest Editors), *Revue d'Intelligence Artificielle : numéro spécial Planification et contrôle du mouvement en robotique*, 7(4), Hermes, 1993.
- [11] C. LAUGIER (Guest Editor), *Geometric reasoning for perception and action*, Lecture notes in computer science. Springer, 1993.
- [12] T. FRAICHARD, C. LAUGIER (Guest Editors), *Proc. of the European Prometheus Workshop on Intelligent Co-Pilot*, Grenoble (FR), 1991.
- [13] C. LAUGIER, *Raisonnement géométrique et méthodes de décision en robotique. Application à la programmation automatique des robots*, Thèse d'état, Inst. Nat. Polytechnique de Grenoble, Grenoble (F), December 1987. 230 pages.
- [14] C. LAUGIER, *Un système d'interprétation graphique de données. Application à l'illustration dynamique de programmes*, Thèse de doctorat, USTMG, Grenoble, France, octobre 1976.

Books Contributions

- [15] C. LAUGIER, S. PETTI, D. VASQUEZ, M. YGUEL, TH. FRAICHARD, O. AYCARD, « Steps Towards Safe Navigation in Open and Dynamic Environments ». In : "Autonomous navigation in dynamic environments", C. Laugier and R. Chatila (Eds.), *Springer Tracts in Advanced Robotics (STAR)*, Springer-Verlag, July 2007.
- [16] C. LAUGIER, C. MENDOZA SERRANO, K. SUNDARAJ, « Faithfull Haptic Feedback in Medical Simulators ». In : *Experimental Robotics VIII*, Bruno Siciliano and Paolo Dario (Eds.), *Springer Tracts in Advanced Robotics (STAR)*, Vol. 5, Springer-Verlag, Spring 2003.
- [17] C. LAUGIER, C. MENDOZA SERRANO, K. SUNDARAJ, « Towards a Realistic Medical Simulator Using Virtual Environments and Force Feedback ». In : *Robotics Research X*, Raymond Jarvis and Alexander Zelinsky (Eds.), *Springer Tracts in Advanced Robotics (STAR)*, Vol. 6, Springer-Verlag, Spring 2003.
- [18] C. LAUGIER, TH. FRAICHARD, « Chapter : Decisional Architectures for Motion Autonomy », In : *Intelligent Vehicle Technologies*, L. Vlacic, F. Harashima, and M. Parent (Eds.), Butterworth-Heinemann, 2001.
- [19] A. DEGUET, A. JOUKHADAR, C. LAUGIER, « Models and Algorithms for the Collision of Rigid and Deformable Bodies », In : *Robotics. The Algorithmic Perspective*, P. K. Agarwal, L. E. Kavrakı, et M. T. Mason (Eds.), AKPeters, 1998, p. 327–338.
- [20] I. E. PAROMTCHIK, P. GARNIER, C. LAUGIER, « Autonomous Maneuvers of a Nonholonomic Vehicle », in : *Intelligent Autonomous Systems*, Ufa State Aviation Technical University (RU), 1998, p. 38–45,
- [21] I. E. PAROMTCHIK, P. GARNIER, C. LAUGIER, « Autonomous Maneuvers of a Nonholonomic Vehicle », in : *Experimental Robotics V*, A. Casals and A. T. Almeida (Eds.), *Lecture Notes in Control and Information Science*, Springer-Verlag, 1998, p. 277–288.
- [22] A. JOUKHADAR, C. LAUGIER, « Dynamic Simulation : Model, Basic algorithms, and Optimization », in : *Algorithms For Robotic Motion and Manipulation*, J.-P. Laumond and M. Overmars (Eds.), A.K. Peters Publisher, 1997, p. 419–434.

- [23] I. E. PAROMTCHIK, C. LAUGIER, « Parking a nonholonomic autonomous vehicle », *in : Advances in Robotics : the European Robotics Network (ERNET) Perspective*, C. Bonivento, C. Melchiorri, and T. H. (Eds.), World Scientific Publishing Co., 1996, p. 153–162,
- [24] B. TRIGGS, C. LAUGIER, « Automatic Task Planning for Robot Vision », *in : Robotics Research VII*, G. Giralt and G. Hirzinger (Eds.), Springer-Verlag, 1996, p. 428–439.
- [25] T. FRAICHARD, C. LAUGIER, « Kinodynamic Planning in a Structured and Time-Varying Workspace », *in : Geometric Reasoning for Perception and Action*, C. Laugier (Eds.), *Lecture Notes in Computer Science*, 708, Springer-Verlag, 1993, p. 19–37.
- [26] C. LAUGIER, A. LUCIANI, S. JIMENEZ, « Physical modeling and dynamic simulation of planet vehicles. Application to the motion prediction », Chapter : Planetary mobile vehicles, *Série Colloque*, Centre Nat. d’Etudes Spatiales, September 1992.
- [27] C. MILÉSI-BELLIER, C. LAUGIER, E. MAZER, J. TROCCAZ, « A practical system for planning safe trajectories for manipulator robots », Chapter : Planning and Programming, *in : Mechatronics and Robotics I*, I. Press, Esprit CIM-Europe, July 1991, p. 153–163.
- [28] C. LAUGIER, *Techniques de la Robotique - Perception et Planification*, Chapitre : Traitement des incertitudes en programmation automatique des robots, Jean-Daniel Boissonnat, Bernard Faverjon, Jean-Pierre Merlet (Eds.), HERMES, 1989, 46 pages.
- [29] C. LAUGIER, « Planning robot motions in the SHARP system », *in : CAD-Based Programming for Sensory Robots*, B. Ravani (Eds.), *NATO ASI Série F*, 50, Springer-Verlag, 1988, p. 151–188.
- [30] C. LAUGIER, « A program for automatic grasping of objects with a robot arm », *in : Int. Trends in Manufacturing Technology : Robot Grippers*, D. Pham et W. Heginbotham (Eds.), IFS Publications Ltd, Springer-Verlag, UK, 1986, p. 43–53.
- [31] J. LATOMBE, C. LAUGIER, J. LEFEBVRE, E. MAZER, J. MIRIBEL, « The LM robot programming system », *in : Proc. of the Int. Symp. on Robotics Research*, H. Hanafusa et H. Inoue (Eds.), MIT Press, 1985.
- [32] C. LAUGIER, J. PERTIN, « Automatic Grasping : a case study in accessibility analysis », *in : Advances Software in Robotics*, A. Danthine et M. Gérardin (Eds.), Noth Holland, 1984, p. 201–204.
- [33] C. LAUGIER, B. DUFAY, « Geometric Reasoning in automatic grasping and contact analysis », *in : Advances in CAD-CAM*, T. Ellis et O. Semenov (Eds.), North Holland, 1983, p. 473–482.

Journal Papers

- [34] D. VASQUEZ, TH. FRAICHARD, C. LAUGIER, « Intentional motion on-line learning and prediction ». *Journal of Machine Vision and Applications (MVA)*, to appear end of 2007.
- [35] D. VASQUEZ, TH. FRAICHARD, C. LAUGIER, « Long-term prediction of future motion through visual observation and learning ». *Journal of Autonomous Robots (JAR)*, revised version under review.
- [36] D. VASQUEZ, TH. FRAICHARD, C. LAUGIER, « Incremental learning of statistical motion patterns with Growing Hidden Markov Models ». *IEEE Trans. on Intelligent Transport Systems (IEEE-ITS)*, submitted on invitation, under review.
- [37] B. REBSAMEN, E. BURDET, C. GUAN, H. ZHANG, C.L. TEO, Q. ZENG, C. LAUGIER, M. ANG, « Controlling a Wheelchair in a Building using Thought ». *IEEE Intelligent Systems*, April 2007.
- [38] C. LAUGIER, D. VASQUEZ, M. YGUEL, TH. FRAICHARD, O. AYCARD, « Geometric and Bayesian models for safe navigation in dynamic environments ». *International Journal of Intelligent Service Robotics (ISR)*, February 2007.
- [39] C. TAY, K. MEKHNACHA, C. CHEN, M. YGUEL, C. LAUGIER, « An efficient formulation of the Bayesian Occupancy Filter for Target Tracking in Dynamic Environments ». *International Journal of Vehicle Autonomous System (IJVAS). Special issue on “Intelligent Vehicles”*, Volume to appear, Winter 2007.
- [40] M. YGUEL, O. AYCARD, C. LAUGIER, « Efficient GPU-based Construction of Occupancy Grids using several Range Finders ». *International Journal of Vehicle Autonomous System (IJVAS). Special issue on “Intelligent Vehicles” Autonomous Vehicle (IJAV)*, Volume to appear, Winter 2007.
- [41] C. COUE, C. PRADALIER, C. LAUGIER, TH. FRAICHARD, P. BESSIÈRE, « Bayesian Occupancy Filtering for Multi-Target Tracking : an Automotive Application ». *International Journal of Robotics Research (IJRR)*, Vol. 25, Nb. 1, Page 19-30, January 2006.
- [42] F. LARGE, C. LAUGIER, Z. SHILLER, « Navigation Among Moving Obstacles Using NLVO : Principles and Applications to Intelligent Vehicles », *Autonomous Robot Journal*, Vol.19, Number 2, Page 159-171, September 2005.
- [43] D. DAULIGNAC, C. LAUGIER, J. TROCCAZ, S. VIERA, « Towards a realistic echographic simulator », *Journal of Medical Image Analysis*, Available on-line since 27 May 2005.
- [44] C. PRADALIER, J. HERMOSILLO, C. KOIKE, P. BESSIÈRE, C. LAUGIER, « The Cycab : a Car-Like Robot Navigating Autonomously and Safely Among Pedestrians », *Robotics and Autonomous Systems Journal (RAS)*, Vol. 50, Number 1, Page 51-68, 2005.

- [45] J. HERMOSILLO, C. PRADALIER, S. SEKHAVAT, C. LAUGIER, « Autonomous Navigation of a Bi-steerable Car : Experimental issues », *Machine Intelligence and Robotic Control Journal (MIROC)*, 2004.
- [46] K. SUNDARAJ, C. LAUGIER, F. BOUX-DE-CASSON, « Towards a Complete Inter-operative CT-Free Navigation System for Arthroscopy Anterior Cruciate Ligament Reconstruction », *Int. Journal of Human Friendly Welfare Robotic Systems*, Vol. 5, 2004.
- [47] C. MENDOZA, C. LAUGIER, « Explicit Non-Linear Finite Elements for Rendering Haptic Cutting in Medical Simulators », *Submitted to Journal of Advanced Robotics*, September 2003.
- [48] M. CHERIF, M. VIDAL, AND C. LAUGIER, « A roadmap-based algorithm for planning handling operations in changing industrial plants ». *Int. Journ. of Robotics and Automation*, 2001. Dec. 1999.
- [49] A. DEGUET, A. JOUKHADAR, C. LAUGIER, « A validation of the penalty model for collisions », *Advanced Robotics* 13, 7, 1999, p. 691–702.
- [50] C. LAUGIER, T. FRAICHARD, P. GARNIER, I. E. PAROMTCHIK, A. SCHEUER, « Sensor-based control architecture for a car-like vehicle », *Autonomous Robots* 6, 2, April 1999, p. 165–185.
- [51] F. DE LA ROSA, C. LAUGIER, J. NÁJERA, « Robust Path Planning in the Plane », *IEEE Trans. Robotics and Automation* 12, 2, April 1996, p. 347–352.
- [52] C. BARD, C. LAUGIER, C. MILÉSI-BELLIER, J. TROCCAZ, B. TRIGGS, G. VERCELLI, « Achieving dextrous grasping by integrating planning and vision based sensing », *Int. Journal of Robotics Research* 14, 5, October 1995, p. 445–464.
- [53] M. HASSOUN, C. LAUGIER, « An architecture for motion planning and motion control of a car-like vehicle », *Mathl. Comp. Modelling* 22, 4–7, 1995, p. 329–341.
- [54] F. DE LA ROSA, C. LAUGIER, J. NÁJERA, « Planning Motion Strategies in the Contact Space under Geometric Uncertainty Constraints », *Revue d'Intelligence Artificielle* 8, 3, 1994, p. 279–312.
- [55] C. LAUGIER, A. JIMENEZ, A. LUCIANI, « Simulating Physical Interactions Between an Articulated Mobile Vehicle and a Terrain », in : *Robotics and Autonomous Systems*, 2, 11, Elsevier, 1994, ch. Special Issue on Telerobotics.
- [56] C. LAUGIER, P. THEVENEAU, P. PUGET, « Dealing with geometric uncertainty constraints when planning robot actions », *Revue d'Intelligence Artificielle* 5, 4, 1991.
- [57] C. LAUGIER, « Geometric reasoning in motion planning », *Int. Journal of Robotics Research*, 1991, Retiré de la publication IJRR par l'auteur. Publié comme rapport de Recherche INRIA no.932, Nov. 1988, 40 pages.
- [58] C. LAUGIER, « Les apports respectifs des langages symboliques et de la CAO en programmation des robots », *Robotica* 6, 1988, p. 243–253.
- [59] C. LAUGIER, J. LATOMBE, « Les systèmes de programmation de robots », *Revue Française de Mécanique* 4, 1987, p. 223–235.

Conference Papers

- [60] D. VASQUEZ, C. LAUGIER, TH. FRAICHARD, « Incremental learning of statistical motion patterns with Growing Hidden Markov Models ». In *Proc. of the International Symposium of Robotics Research (ISRR'07)*, Hiroshima (Japan), November 2007.
- [61] C. TAY, C. LAUGIER, « Modelling Smooth Paths using Gaussian Processes ». In *Proc. of the Int. Conf. on Field and Service Robotics (FSR'07)*, Chamonix (France), July 2007.
- [62] D. VASQUEZ, T. BELLARDI, C. LAUGIER, « Fast object extraction from images and occupancy grids using Self Organizing Networks ». In *Proc. of the IEEE/RSJ IROS'07 Workshop on "Safe navigation in open and dynamic environments"*, San Diego (USA), October 2007.
- [63] M. YGUEL, C. LAUGIER, O. AYCARD, « A complete framework for a fast SLAM algorithm based on hierarchical occupancy grids ». In *Proc. of the IEEE/RSJ IROS'07 Workshop on "Safe navigation in open and dynamic environments"*, San Diego (USA), October 2007.
- [64] B. REBSAMEN, E. BURDET, C. GUAN, H. ZANG, Q. ZENG, M. ANG, C. LAUGIER, « Hybrid P300 and Mu-Beta Brain Computer Interface to operate a Brain Controlled Wheelchair ». In *Proc. of the IEEE/RSJ IROS'07 Workshop on "Safe navigation in open and dynamic environments"*, San Diego (USA), October 2007.
- [65] C. FULGENZI, A. SPALANZANI, C. LAUGIER, « Dynamic obstacle avoidance in uncertain environments by combining PVOs and Occupancy Grids ». In *Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA'07)*, Roma (Italy), April 2007.
- [66] C. FULGENZI, A. SPALANZANI, C. LAUGIER, « Combining Probability Velocity Obstacles and Occupancy Grids for Safe Navigation in Dynamic Environments ». In *Proc. of the IEEE ICRA'07 workshop on "Autonomous Navigation in Dynamic Environments"*, Roma (Italy), April 2007.
- [67] M. YGUEL, C. TAY, C. BRAILLON, C. LAUGIER, « Dense Mapping for Range Sensors : Efficient Algorithms and Sparse Representations ». In *Proc. of the Int. Conf. on Robotics Science and Systems (RSS'07)*, Atlanta (USA), June 2007.

- [68] M. YGUEL, C. TAY, C. BRAILLON, C. LAUGIER, « *Dense Mapping using Range Sensor data and wavelets* ». In Proc. of the Int. Conf. on Field and Service Robotics (FSR'07), *Chamonix (France), July 2007*.
- [69] B. REBSAMEN, E. BURDET, C. GUAN, H. ZANG, Q. ZENG, M. ANG, C. LAUGIER, « *A Brain-Controlled Wheelchair Based on P300 and Path Guidance* ». In Proc. of the IEEE Int. Conference on Biomedical Robotics and Biomechanics (BioRob), *Pisa (Italy), 2006*.
- [70] J. BURLET, O. AYCARD, A. SPALANZANI, C. LAUGIER, « *Adaptive Interactive Multiple Models applied on Pedestrian Tracking in Car Parks* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS'06), *Beijing (China), October 2006*.
- [71] M. YGUEL, O. AYCARD, C. LAUGIER, « *Efficient GPU-based Construction of Occupancy Grids using several Laser Range Finders* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS'06), *Beijing (China), October 2006*.
- [72] C. BRAILLON, K. USHER, C. PRADALIER, J. CROWLEY, C. LAUGIER, « *Real-time Stereo and Optical Flow Fusion* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS'06), *Beijing (China), October 2006*.
- [73] C. CHEN, C. TAY, K. MEKHNACHA, C. LAUGIER, « *Dynamic environment modeling with gridmap : a multiple-object tracking application* ». In Proc. of the Int. Conf. on Control, Automation, Robotics and Vision (ICARCV'06), *Singapore, December 2006*.
- [74] D. VASQUEZ, F. ROMANELLI, TH. FRAICHARD, C. LAUGIER, « *Fast Object Extraction from Bayesian Occupancy Grids using Self Organizing Networks* ». In Proc. of the Int. Conf. on Control, Automation, Robotics and Vision (ICARCV'06), *Singapore, December 2006*.
- [75] C. BRAILLON, K. USHER, C. PRADALIER, J. CROWLEY, C. LAUGIER, « *Fusion of Stereo and Optical Flow data using Occupancy Grids* ». In Proc. of the IEEE Int. Conf. on Intelligent Transportation Systems (ITSC'06), *Toronto (Canada), September 2006*.
- [76] J. BURLET, O. AYCARD, A. SPALANZANI, C. LAUGIER, « *Pedestrian Tracking in Car Parks : an Adaptive Interacting Multiple Model based Filtering Method* ». In Proc. of the IEEE Int. Conf. on Intelligent Transportation Systems (ITSC'06), *Toronto (Canada), September 2006*.
- [77] M. YGUEL, O. AYCARD, D. RAULO, C. LAUGIER, « *Grid based Fusion of Offboard Cameras* ». In Proc. of the IEEE Int. Symp. on Intelligent Vehicles (IV'06), *Tokyo (Japan), June 2006*.
- [78] O. AYCARD, A. SPALANZANI, M. YGUEL, J. BURLET, TH. FRAICHARD, C. LAUGIER, D. RAULO, « *Pivame - New French Approach for Vulnerable Road Users Safety* ». In Proc. of the IEEE Int. Symp. on Intelligent Vehicles (IV'06), *Tokyo (Japan), June 2006*.
- [79] C. BRAILLON, C. PRADALIER, J. CROWLEY, C. LAUGIER, « *Real-time Moving Obstacle Detection using Optical Flow Models* ». In Proc. of the IEEE Int. Symp. on Intelligent Vehicles (IV'06), *Tokyo (Japan), June 2006*.
- [80] C. BRAILLON, K. USHER, C. PRADALIER, J. CROWLEY, C. LAUGIER, « *Occupancy Grids from Stereo and Optical Flow data* ». In Proc. of the Int. Symp. on Experimental Robotics (ISER'06), *Rio de Janeiro (Brasil), July 2006*.
- [81] A. NEGRE, C. BRAILLON, J. CROWLEY, C. LAUGIER, « *Real-time Time-to-Collision from Variation of Intrinsic Scale* ». In Proc. of the Int. Symp. on Experimental Robotics (ISER'06), *Rio de Janeiro (Brasil), July 2006*.
- [82] D. VASQUEZ, TH. FRAICHARD, O. AYCARD, C. LAUGIER, « *Intentional Motion On-Line Learning and Prediction* ». In Proc. of the Int. Conf. on Field and Service Robotics (FSR'05), *Port Douglas (Australia), July 2005*. Papier selected for a special issue of the International Journal of Robotics Research.
- [83] C. TAY, C. PRADALIER, C. LAUGIER, « *On-Line Reconstruction of Vehicles in a Car Park* ». In Proc. of the Int. Conf. on Field and Service Robotics (FSR'05), *Port Douglas (Australia), July 2005*.
- [84] M. YGUEL, O. AYCARD, C. LAUGIER, « *Wavelet Occupancy Grids : a Method for Compact Map Building* ». In Proc. of the Int. Conf. on Field and Service Robotics (FSR'05), *Port Douglas (Australia), July 2005*.
- [85] C. TAY, C. PRADALIER, C. LAUGIER, « *Vehicle Detection and Car Park Mapping using Laser Scanner* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS'05), *Edmonton (Canada), August 2005*.
- [86] C. LAUGIER, S. PETTI, D. VASQUEZ, M. YGUEL, TH. FRAICHARD, O. AYCARD, « *Steps Towards Safe Navigation in Open and Dynamic Environments* ». In Proc. of the IEEE ICRA 2005 Workshop on Autonomous Navigation in Dynamic Environments, *Bracelona (Spain), April 2005*.
- [87] D. VASQUEZ, F. LARGE, T. FRAICHARD, C. LAUGIER, « *Moving Obstacles Motion Prediction for Autonomous Navigation* ». In Proc. of the IEEE Int. Conf. on Automation, Robotics, Control, and Vision (IARCV), *Kuming, China, Dec. 2004*.
- [88] M. KAIS, S. MORIN, A. DE LA FORTELLE, C. LAUGIER, « *Geometric Model to Drive Vision Systems with Error Propagation* ». In Proc. of the IEEE Int. Conf. on Automation, Robotics, Control, and Vision (IARCV), *Kuming, China, Dec. 2004*.
- [89] M. KAIS, S. DAUVILLIER, A. DE LA FORTELLE, I. MASAKI, C. LAUGIER, « *Towards Outdoor Localization using GIS, Vision System and Stochastic Error Propagation* ». In Proc. of the International Conference on Autonomous Robots and Agents (ICARA), *Palmerston North (New Zealand), Dec. 2004*.

- [90] C. PRADALIER, P. BESSIERE, C. LAUGIER, « *Driving on a known sensori-motor trajectory with a car-like robot* ». In Proc. of the IEEE Int. Conf. on Robotics and Automation (ISER'04), Singapore, June 2004.
- [91] C. PRADALIER, J. HERMOSILLO, C. KOIKE, C. BRAILLON, P. BESSIERE, C. LAUGIER, « *An Autonomous Car-Like Robot Navigating Safely among Pedestrians* ». In Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA'03), New Orleans, LA (US), April 2004.
- [92] K. SUNDARAJ, C. LAUGIER, F. BOUX-DE-CASSON, « *Towards a complete Intra-Operative CT-Free Navigation System for Arthroscopy Anterior Cruciate Ligament Reconstruction* ». In Proc. of the Int. Symposium on Medical Simulation, Cambridge, MA (US), June 2004.
- [93] D. VASQUEZ, F. LARGE, T. FRAICHARD, C. LAUGIER, « *High-Speed Autonomous Navigation with Motion Prediction for Unknown Moving Obstacles* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), Sendai (JP), October 2004.
- [94] F. LARGE, D. VASQUEZ, T. FRAICHARD, C. LAUGIER, « *High-Speed among Unknown Moving Obstacles* ». In Proc. of the IEEE Intelligent Vehicles Symposium (IV), Parma (Italy), June 2004.
- [95] K. SUNDARAJ, C. LAUGIER, F. BOUX-DE-CASSON, « *Intra-Operative CT-Free Examination System for Anterior Cruciate Ligament Reconstruction* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS 2003), Las Vegas (USA), October 2003.
- [96] C. PRADALIER, J. HERMOSILLO, C. KOIKE, C. BRAILLON, P. BESSIERE, C. LAUGIER, « *Safe and Autonomous Navigation for a Car-Like Robot among Pedestrian* ». In Workshop of the International Advanced Robotics Programme (IARP'03), Madrid (Spain), October 2003.
- [97] C. MENDOZA SERRANO, C. LAUGIER, O. GALIZZI, F. FAURE, « *Dynamic simulation and 3D intercation* ». In Proc. of 4^{ème} Journées Nationales de Recherche en Robotique (JNRR'02), Clermont-Ferrand (F), October 2003.
- [98] C. MENDOZA SERRANO, C. LAUGIER, « *Cutting using Haptics and non-linear Finite Element Models* ». In Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA'03), Taipei (Taiwan), Sept. 2003.
- [99] J. HERMOSILLO, C. PRADALIER, S. SEKHAVAT, C. LAUGIER, « *Towards Motion Autonomy of a Bi-steerable Car : Experimental Issues from Map-Building to Trajectory Execution* ». In Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA'03), Taipei (Taiwan), Sept. 2003.
- [100] C. COUE, C. PRADALIER, C. LAUGIER, « *Bayesian Programming for Multi-Target Tracking : an Automotive Application* ». In Proc. of the Int. Conf. on Field and Service Robotics (FSR'03), Lake Yamanaka (Japan), July 2003.
- [101] J. HERMOSILLO, C. PRADALIER, S. SEKHAVAT, C. LAUGIER, « *Experimental Issues from Map Building to Trajectory Execution for a Bi-steerable Car* ». In Proc. of the Int. Conf. on Advanced Robotics (ICAR'03), Coimbra (Portugal), July 2003.
- [102] C. MENDOZA SERRANO, C. LAUGIER, « *Tissue Cutting using Finite Elements and Force Feedback* ». In Proc. of the Int. Symp. on Surgery Simulation and Soft Tissue Modelling, Juan-Les-Pins (F), June 2003.
- [103] C. LAUGIER, C. MENDOZA SERRANO, K. SUNDARAJ, « *Faithfull Haptic Feedback in Medical Simulators* ». In Proc. of the Int. Symp. on Experimental Robotics (ISER'02), Ischia (I), July 2002.
- [104] K. SUNDARAJ, C. LAUGIER, « *Physically Realistic Simulation of Large Deformations using LEM for Interactive Applications* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS 2002), Lausanne (Switzerland), Oct. 2002.
- [105] F. LARGE, S. SEKHAVAT, Z. SHILLER, C. LAUGIER, « *Towards Real-Time Global Motion Planning in a Dynamic Environment using NLVO concept* ». In Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS 2002), Lausanne (Switzerland), Oct. 2002.
- [106] C. MENDOZA SERRANO, K. SUNDARAJ, C. LAUGIER, « *Issues in Deformable Virtual Objects Simulation with Force Feedback* ». In Workshop of the International Advanced Robotics Programme (IARP'02), Rome (I), Oct. 2002.
- [107] K. SUNDARAJ, C. MENDOZA, C. LAUGIER, « *A fast Method to Simulate Virtual Deformable Objects with Force Feedback* ». In Proc. of the IEEE Int. Conf. on Automation, Robotics, Control, and Vision (ICARCV 2002), Singapore, Dec. 2002.
- [108] F. LARGE, S. SEKHAVAT, Z. SHILLER, C. LAUGIER, « *Using Non-Linear Velocity Obstacles to Plan Motions in a Dynamic Environments* ». In Proc. of the IEEE Int. Conf. on Automation, Robotics, Control, and Vision (ICARCV 2002), Singapore, Dec. 2002.
- [109] P. PEK, O. LEBELTEL, C. LAUGIER, « *Parking a Car using Bayesian Programming* ». In Proc. of the IEEE Int. Conf. on Automation, Robotics, Control, and Vision (ICARCV 2002), Singapore, Dec. 2002.
- [110] C. MENDOZA SERRANO, C. LAUGIER, AND F BOUX DE CASSON, « *Virtual reality cutting phenomena using force feedback for surgery simulations* ». In Proc. of the Int. Conf. on Interactive Medical Image Visualization and Analysis, Utrecht (NL), Oct. 2001.
- [111] C. MENDOZA SERRANO AND C. LAUGIER, « *Realistic haptic rendering for highly deformable virtual objects* ». In Proc. of the Int. Conf. on Virtual Reality, Yokohama (JP), March 2001.

- [112] K. SUNDARAJ, C. LAUGIER, AND I. COSTA FERREIRA, « *An approach to LEM modeling : Construction, collision detection and dynamic simulation* ». In Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Hawaii, HI (US), Oct. 2001.
- [113] D. D'AULIGNAC, R. BALANIUK, C. LAUGIER, « *A Haptic Interface for a Virtual Exam of the Human Thigh* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 3, p. 2452–2457, San Francisco, CA (US), April 2000.
- [114] F. LARGE, S. SEKHAVAT, C. LAUGIER, E. GAUTHIER, « *Towards Robust Sensor-Based Maneuvers for a Car-Like Vehicle* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 4, p. 3765–3770, San Francisco, CA (US), April 2000.
- [115] F. BOUX DE CASSON, C. LAUGIER, « *Simulating 2D Tearing Phenomena for Interactive Medical Surgery Simulators* », in : Proc. of Computer Animation, Philadelphia, PA (US), May 2000.
- [116] F. LARGE, J. HERMOSILLO, S. SEKHAVAT, C. LAUGIER, « *Using Artificial Neural Networks to Improve Sensor-Based Maneuvers for a Car-Like Vehicle* », in : Proc. of the Int. Conf. on Intelligent Autonomous Systems, p. 1033–1040, Venezia (IT), July 2000.
- [117] D. GUO, T. FRAICHARD, M. XIE, C. LAUGIER, « *Color Modeling by Spherical Influence Field in Sensing Driving Environment* », in : Proc. of IEEE Intelligent Vehicle Symposium, p. 249–254, Dearborn, MI (US), Oct. 2000.
- [118] J.-M. AHUACTZIN, D. RAULO, C. LAUGIER, « *A Multi Purpose Object Oriented Path Planner* », in : Proc. of the Int. Symp. on Robotics and Automation, Monterrey (MX), Nov. 2000.
- [119] R. BALANIUK, C. LAUGIER, « *Haptic interfaces in generic virtual reality systems* », in : Proc. of the IEEE-RSJ Int. Workshop on Intelligent Robots and Systems, Takamatsu (JP), Nov. 2000.
- [120] D. RAULO, J.-M. AHUACTZIN, C. LAUGIER, « *Controlling Virtual Autonomous Entities in Dynamic Environments Using an Appropriate Sense-Plan-Control Paradigm* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Takamatsu (JP), Nov. 2000.
- [121] J. LU, S. SEKHAVAT, M. XIE, C. LAUGIER, « *Sliding Mode Control for Nonholonomic Mobile Robot* », in : Proc. of the Int. Conf. on Control, Automation, Robotics and Vision, p. 465–470, Singapore (SG), Dec. 2000.
- [122] K. SUNDARAJ, C. LAUGIER, « *Fast contact localisation of moving deformable polyhedras* », in : Proc. of the Int. Conf. on Control, Automation, Robotics and Vision, Singapore (SG), Dec. 2000.
- [123] M. CHERIF, J. IBANEZ-GUZMAN, C. LAUGIER, T. GOH, « *Motion planning for an all-terrain autonomous vehicle* », in : Proc. of the Int. Conf. on Field and Service Robotics, p. 104–109, Pittsburgh, PA (US), August 1999.
- [124] C. LAUGIER, M. PARENT, « *Automated vehicles for future urban transport systems* », in : Proc. of the Int. Conf. on Field and Service Robotics, p. 191–196, Pittsburgh, PA (US), August 1999.
- [125] F. BOUX DE CASSON, C. LAUGIER, « *Modelling the dynamics of a human liver for a minimally invasive simulator* », in : Proc. of the Int. Conf. on Medical Image Computer-Assisted Intervention, Cambridge (GB), Sept. 1999.
- [126] D. D'AULIGNAC, M. C. CAVUSOGLU, C. LAUGIER, « *Modelling the dynamics of a human thigh for a realistic echographic simulator with force feedback* », in : Proc. of the Int. Conf. on Medical Image Computer-Assisted Intervention, Cambridge (BG), Sept. 1999.
- [127] A. DEGUET, A. JOUKHADAR, C. LAUGIER, « *Modèles et algorithmes pour la simulation dynamique de corps rigides et déformables* », in : Journées Nationales de la Recherche en Robotique, p. 95–108, Montpellier (FR), Sept. 1999.
- [128] C. LAUGIER, I. E. PAROMTCHIK, M. PARENT, « *Developing Autonomous Maneuvering capabilities for Future Cars* », in : Proc. of the Int. Conf. on Intelligent Transportation Systems, p. 68–73, Tokyo (JP), Oct. 1999.
- [129] D. D'AULIGNAC, C. LAUGIER, M. C. CAVUSOGLU, « *Towards a realistic echographic simulator with force feedback* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 2, p. 727–732, Kyongju (KR), Oct. 1999.
- [130] J. LU, S. SEKHAVAT, C. LAUGIER, « *Fuzzy variable-structure control for Nonholonomic vehicle path tracking* », in : Proc. of the Int. Conf. on Intelligent Transportation Systems, p. 465–470, Tokyo (JP), Oct. 1999.
- [131] A. JOUKHADAR, A. SCHEUER, C. LAUGIER, « *Fast Contact Detection between Moving Deformable Polyhedra* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 3, p. 1810–1815, Kyongju (KR), Oct. 1999.
- [132] S. V. GUSEV, I. A. MAKAROV, I. E. PAROMTCHIK, V. A. YAKUBOVICH, C. LAUGIER, « *Adaptive motion control of a nonholonomic vehicle* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 4, p. 3285–3290, Leuven (BE), May 1998.
- [133] A. JOUKHADAR, A. DEGUET, C. LAUGIER, « *A Collision Model for Rigid and Deformable Bodies* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 2, p. 982–988, Leuven (BE), May 1998.
- [134] I. E. PAROMTCHIK, P. GARNIER, C. LAUGIER, « *Motion Control for Autonomous Maneuvers of a Nonholonomic Vehicle* », in : Proc. of the Int. Symp. on Advanced Vehicle Control, p. 485–491, Nagoya (JP), Sept. 1998.
- [135] A. SCHEUER, C. LAUGIER, « *Planning Sub-Optimal and Continuous-Curvature Paths for Car-Like Robots* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 1, p. 25–31, Victoria, BC (CA), Oct. 1998.

- [136] A. DEGUET, A. JOUKHADAR, C. LAUGIER, « *A Collision Model for Deformable Bodies* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Victoria, BC (CA), Oct. 1998*.
- [137] C. LAUGIER, T. FRAICHARD, I. E. PAROMTCHIK, P. GARNIER, « *Sensor-Based Control Architecture for a Car-Like Vehicle* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 1, p. 216–222, *Victoria, BC (CA), Oct. 1998*.
- [138] I. E. PAROMTCHIK, C. LAUGIER, S. V. GUSEV, S. SEKHAVAT, « *Motion Control for Autonomous Car Maneuvering* », in : Proc. of the Int. Conf. on Control, Automation, Robotics and Vision, 1, p. 136–140, *Singapore (SG), Dec. 1998*.
- [139] I. E. PAROMTCHIK, C. LAUGIER, « *The Advanced Safety Vehicle programme* », in : Actes du colloque sur les véhicules électriques, *Grenoble (FR), Feb. 1997*.
- [140] A. JOUKHADAR, F. GARAT, C. LAUGIER, « *Parameter Identification for Dynamic Simulation* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 3, p. 1928–1933, *Albuquerque, NM (US), April 1997*.
- [141] A. KHEDDAR, C. TZAFESTAS, P. COIFFET, T. KOTOKU, S. KAWABATA, K. IWAMOTO, K. TANIE, I. MAZON, C. LAUGIER, R. CHELLALI, « *Parallel multi-robots long-distance cooperation* », in : Proc. of the IEEE Int. Conf. on Advanced Robotics, *Monterey, CA (US), June 1997*.
- [142] I. PAROMTCHIK, P. GARNIER, C. LAUGIER, « *Autonomous Maneuvers of a Nonholonomic Vehicle* », in : Proc. of the Int. Symp. on Experimental Robotics, *Barcelona (ES), June 1997*.
- [143] A. JOUKHADAR, A. DEGUET, C. LAUGIER, « *Towards Realistic Dynamic Simulation : Deformations and Collisions Models* », in : Proc. of the Workshop on Dynamic Simulation : Methods and Applications, p. 21–31, *Grenoble (FR), Sept. 1997. Workshop held in association with the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems*.
- [144] A. JOUKHADAR, F. GARAT, C. LAUGIER, « *Constraint-based Identification of a Dynamic Model* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Grenoble (FR), Sept. 1997*.
- [145] P. GARNIER, T. FRAICHARD, C. LAUGIER, I. PAROMTCHIK, A. SCHEUER, « *Motion Autonomy Through Sensor-Guided Manœuvres* », in : Proc. of the Intelligent Cars and Automated Highway Systems Workshop, p. 20–30, *Grenoble (FR), Sept. 1997. Workshop held in association with the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems*.
- [146] C. LAUGIER, « *Modèles déformables et Interaction entre objets virtuels* », in : Actes du séminaire “Environnements Virtuels Distribués”, *Secrétariat d’Etat à l’Industrie, Lyon (FR), Dec. 1997*.
- [147] C. LAUGIER, P. GARNIER, T. FRAICHARD, I. PAROMTCHIK, A. SCHEUER, « *Motion Planning and Sensor-Guided Manœvre Generation for an Autonomous Vehicle* », in : Proc. of the Int. Conf. on Field and Service Robotics, p. 56–65, *Canberra (AU), Dec. 1997*.
- [148] I. E. PAROMTCHIK, C. LAUGIER, « *Motion Generation and Control for Parking an Autonomous Vehicle* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, p. 3117–3122, *Minneapolis, MN (US), April 1996*.
- [149] D. REZNIK, C. LAUGIER, « *Dynamic Simulation and Virtual Control of a Deformable Fingertip* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 2, p. 669–674, *Minneapolis, MN (US), April 1996*.
- [150] C. NOVALES, D. PALLARD, C. LAUGIER, « *Controlling the Motions of an Autonomous Vehicle using a Local Navigator* », in : Proc. of the Int. Symp. on Robotics and Manufacturing, *Montpellier (FR), May 1996*.
- [151] J. NÁJERA, C. LAUGIER, W. WITWROW, J. DE SCHUTTER, « *Integrating assembly planning with compliant control* », in : Proc. of the Int. Symp. on Robotics and Manufacturing, *Montpellier (FR), May 1996*.
- [152] A. JOUKHADAR, A. WABBI, C. LAUGIER, « *Fast Contact Localisation Between Deformable Polyhedra in Motion* », in : Proc. of the IEEE Computer Animation Conf., p. 126–135, *Geneva (CH), June 1996*.
- [153] A. JOUKHADAR, C. LAUGIER, « *Dynamic Simulation : Model, Basic Algorithms, and optimization* », in : Proc. of the Workshop on the Algorithmic Foundations of Robotics, *Toulouse (FR), July 1996*.
- [154] I. E. PAROMTCHIK, C. LAUGIER, « *Autonomous Parallel Parking of a Nonholonomic Vehicle* », in : Proc. of the IEEE Int. Symp. on Intelligent Vehicles, p. 13–18, *Tokyo (JP), Sept. 1996*.
- [155] A. MCLEAN, C. LAUGIER, « *Update and Repair of a Roadmap after Model Error Discovery* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 2, p. 917–924, *Osaka (JP), Nov. 1996*.
- [156] A. JOUKHADAR, C. LAUGIER, « *Adaptive time step for fast converging dynamic simulation system* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 2, p. 418–424, *Osaka (JP), Nov. 1996*.
- [157] H. BRUYNINCKX, W. WITWROW, J. DE SCHUTTER, J. NÁJERA, C. LAUGIER, « *Integration of assembly planning and compliant control : an evaluation* », in : Proc. of the European Workshop on Hazardous Robotics, p. 17–26, *Barcelona (ES), Nov. 1996*.
- [158] C. LAUGIER, I. E. PAROMTCHIK, P. GARNIER, T. FRAICHARD, « *Motion Control of an Autonomous Vehicle Through Sensor-Guided Manœuvres* », in : Proc. of the Int. Conf. on Control, Automation, Robotics and Vision, *Singapore (SG), Dec. 1996*.
- [159] F. DE LA ROSA, J. NÁJERA, C. LAUGIER, « *Dealing with Uncertainty Constraints in Motion Planning* », in : Proc. of the Int. Conf. on Intelligent Autonomous Systems, U. Rembold, R. Dillmann, L. O. Hertzberger, T. Kanade (éditeurs), *IOS Press-OHM Ohmsha, p. 497–504, Karlsruhe (DE), March 1995*.

- [160] M. CHERIF, C. LAUGIER, « *On Physically-Based Modelling and Off-Road Vehicle Motion Planning* », in : Proc. of the Int. Conf. on Intelligent Autonomous Systems, U. Rembold, R. Dillmann, L. O. Hertzberger, T. Kanade (éditeurs), IOS Press-OHM Ohmsha, p. 482-489, Karlsruhe (DE), March 1995.
- [161] M. CHERIF, C. LAUGIER, « *Motion Planning of Autonomous Off-Road Vehicles Under Physical Interaction Constraints* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, Nagoya (JP), May 1995.
- [162] A. JOUKHADAR, C. LAUGIER, « *Dynamic modeling and its robotics applications* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, Nagoya (JP), May 1995.
- [163] B. TRIGGS, C. LAUGIER, « *Automatic Camera Placement for Robot Vision Tasks* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, p. 1732-1737, Nagoya (JP), May 1995.
- [164] P. GARNIER, C. NOVALES, C. LAUGIER, « *An Hybrid Motion Controller for a Real Car-Like Robot Evolving in a Multi-Vehicle Environment* », in : Proc. of the IEEE Int. Symp. on Intelligent Vehicles, p. 326-331, Detroit, MI (US), Sept. 1995.
- [165] J. NÁJERA, F. DE LA ROSA, C. LAUGIER, « *Planning Robot Motion Strategies under Geometric Uncertainty Constraints* », in : Proc. of the Int. Symp. on Industrial Robots., p. 171-176, Singapore (SG), Oct. 1995.
- [166] B. TRIGGS, C. LAUGIER, « *Automatic Task Planning for Robot Vision* », in : Proc. of the Int. Symp. on Robotics Research, G. Giralt, G. Hirzinger (éditeurs), Munchen (DE), Oct. 1995.
- [167] A. JOUKHADAR, C. LAUGIER, « *Fast Dynamic Simulation of Rigid and Deformable Objects* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Pittsburgh, PA (US), Oct. 1995.
- [168] M. HASSOUN, C. LAUGIER, N. LE FORT, D. MEIZEL, « *An assistance system for diagnosis and monitoring of driving manoeuvres* », in : IMACS Int. Symp. on Signal Processing, Robotics and Neural Networks, Lille (FR), April 1994.
- [169] C. LAUGIER, E. MAZER, « *Recherche et Développement en Robotique non Manufacturière* », in : Congrès de l'Association des Ingénieurs de l'INPG (Houille Blanche), Grenoble (FR), April 1994.
- [170] M. CHERIF, C. LAUGIER, C. MILÉSI-BELLIER, B. FAVERJON, « *Planning the Motions of an All-Terrain Vehicle by Using Geometric and Physical Models* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, p. 2050-2056, San Diego, CA (US), May 1994.
- [171] A. JOUKHADAR, C. BARD, C. LAUGIER, « *Planning Dexterous Operations using Physical Models.* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, San Diego, CA (US), May 1994.
- [172] C. LAUGIER, « *Integrating Fine Motion Planning with Compliant Motion Control* », in : Technology Transfer Workshop on Industrial Vision Autonomous Robots Medical Imaging, Leuven (B), June 1994.
- [173] F. DE LA ROSA, J. NÁJERA, C. LAUGIER, « *Planning Robot Motion Strategies under Geometric Uncertainty Constraints* », in : Proc. of the Int. Symp. on Intelligent Robotic Systems, p. 37-44, Grenoble (FR), July 1994.
- [174] O. AL-CHAMI, C. LAUGIER, « *Stratégie Perceptive pour Positionner une Caméra* », in : Proc. AFCET Reconnaissance des Formes et Intelligence Artificielle, 1, p. 617-622, 1994.
- [175] J. NÁJERA, F. DE LA ROSA, C. LAUGIER, « *Planning Robot Motion Strategies under Geometric Uncertainty Constraints* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, p. 462-469, Munchen (DE), Sept. 1994.
- [176] C. BARD, C. LAUGIER, C. MILÉSI-BELLIER, « *An integrated approach to achieve dextrous grasping from task level specification* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Munchen (DE), Sept. 1994.
- [177] M. CHERIF, C. LAUGIER, « *Dealing with Vehicle/Terrain Interactions when Planning the Motions of a Rover* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Munchen (DE), Sept. 1994.
- [178] A. JOUKHADAR, C. BARD, C. LAUGIER, « *Combining geometric and physical models, the case of a dextrous hand.* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, Munchen (DE), Sept. 1994.
- [179] O. ABOU KHALED, N. LE FORT, M. HASSOUN, C. LAUGIER, « *Real-time decision system for the ProlabII demonstrator* », in : Proc. of the IEEE Int. Symp. on Intelligent Vehicles, Paris (FR), Oct. 1994.
- [180] D. CASANOVA, C. LAUGIER, « *Modeling physical objects for the dynamic simulation of robotic tasks* », in : Japan-France congress on MECHATRONICS, Tamakatsu, (JP), Nov. 1994.
- [181] A. JOUKHADAR, C. LAUGIER, « *Robot Φ : A physical modeling system for robotic applications.* », in : Japan-France congress on MECHATRONICS, Tamakatsu, (JP), Nov. 1994.
- [182] D. CASANOVA, C. LAUGIER, « *Generating environments for a physical simulation of robotic tasks* », in : Int. Conf. ORIA, Marseille (FR), Dec. 1994.
- [183] A. JOUKHADAR, C. LAUGIER, « *Dynamic modeling of rigid and deformable objects for robotic task : Motions, deformations, and collisions.* », in : Int. Conf. ORIA, Marseille (FR), Dec. 1994.
- [184] T. FRAICHARD, C. LAUGIER, « *Path-Velocity Decomposition Revisited and Applied to Dynamic Trajectory Planning* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 1, p. 40-45, Atlanta, GA (US), May 1993.

- [185] M. HASSOUN, C. LAUGIER, D. RAMAMONJISOA, N. LEFORT, « *Towards Safe Driving in Traffic Situation by Using an Electronic Co-Pilot* », in : Proc. of the IEEE Int. Symp. on Intelligent Vehicles, *Tokyo (JP)*, July 1993.
- [186] C. MILÉSI-BELLIER, C. LAUGIER, B. FAVERJON, « *A Kinematic Simulator for Motion Planning of a Mobile Robot on a Terrain* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Yokohama (JP)*, July 1993.
- [187] M. CHERIF, C. LAUGIER, « *Using Physical Models to Plan Safe and Executable Motions for a Rover Moving on a Terrain* », in : Int. Workshop on Intelligent Robotic Systems, p. 57–66, *Zakopane (PL)*, July 1993.
- [188] M. HASSOUN, C. LAUGIER, « *Towards a Real-Time Architecture To Control An Autonomous Vehicle In Multi-Vehicle Environment* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Yokohama (JP)*, July 1993.
- [189] F. DE LA ROSA, C. LAUGIER, J. NÁJERA, « *Exploring the Contact Space to Plan Robot Motions under Geometric Uncertainty Constraints* », in : Int. Workshop on Intelligent Robotic Systems, p. 71–80, *Zakopane (PL)*, July 1993.
- [190] C. LAUGIER, S. JIMENEZ, A. LUCIANI, « *Predicting of a Planetary Vehicle Using Physical Modeling* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Yokohama (JP)*, July 1993.
- [191] T. FRAICHARD, C. LAUGIER, « *Dynamic Trajectory Planning, Path-Velocity Decomposition and Adjacent Paths* », in : Proc. of the Int. Joint Conf. on Artificial Intelligence, 2, p. 1592–1597, *Chambéry (FR)*, Sept. 1993.
- [192] M. CHERIF, C. LAUGIER, C. MILÉSI-BELLIER, B. FAVERJON, « *Combining Physical and Geometric Models to Plan Safe and Executable Motions for a Rover Moving on a Terrain* », in : Proc. of the Int. Symp. on Experimental Robotics, p. 22–30, *Kyoto (JP)*, Oct. 1993.
- [193] T. FRAICHARD, C. LAUGIER, « *Kinodynamic planning in a structured and time-varying 2D workspace* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 2, p. 1500–1505, *Nice (FR)*, May 1992.
- [194] M. HASSOUN, C. LAUGIER, « *Reactive motion planning for an intelligent vehicle* », in : Proc. of the IEEE Int. Symp. on Intelligent Vehicles, *Detroit, MI (US)*, June 1992.
- [195] S. JIMENEZ, C. LAUGIER, A. LUCIANI, « *Teleprogramming the motions of a planetary robot using physical models and dynamic simulation tools* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Raleigh, NC (US)*, July 1992.
- [196] T. FRAICHARD, C. LAUGIER, « *Kinodynamic planning with moving obstacles : the case of a structured workspace* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, 3, p. 1524–1531, *Raleigh, NC (US)*, July 1992.
- [197] M. HASSOUN, Y. DEMAZEAU, C. LAUGIER, « *Motion control for a car-like robot : potential field and multi-agent approaches* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Raleigh, NC (US)*, July 1992.
- [198] J. NÁJERA, C. LAUGIER, P. FARROUCH, « *Planification de mouvements fins et raisonnement géométrique dans l'espace des contacts* », in : Premières Rencontres Nationales de Jeunes Chercheurs, *Rennes (FR)*, Sept. 1992.
- [199] T. FRAICHARD, C. LAUGIER, « *On line reactive planning for a non holonomic mobile in a dynamic world* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, 1, p. 432–437, *Sacramento, CA (US)*, April 1991.
- [200] C. BELLIER, C. LAUGIER, E. MAZER, J. TROCCAZ, « *A practical system for planning safe trajectories for manipulator robots* », in : Proc. of the Int. Symp. on Experimental Robotics, *Toulouse (FR)*, June 1991.
- [201] T. FRAICHARD, M. HASSOUN, C. LAUGIER, « *Reactive motion planning in a dynamic world* », in : Proc. of the IEEE Int. Conf. on Advanced Robotics, p. 1028–1032, *Pisa (IT)*, June 1991.
- [202] C. MILÉSI-BELLIER, C. LAUGIER, E. MAZER, J. TROCCAZ, « *Planning/executing six d.o.f. robot motions in complex environments* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Osaka (JP)*, Nov. 1991.
- [203] S. JIMENEZ, C. LAUGIER, A. LUCIANI, « *Physical modeling as an help for planning the motions of a land vehicle* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Osaka (JP)*, Nov. 1991.
- [204] C. LAUGIER, S. JIMENEZ, A. LUCIANI, « *Physical modeling as an help for planning the motion of a land vehicle* », in : Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems, *Osaka (JP)*, Nov. 1991.
- [205] T. FRAICHARD, C. LAUGIER, « *Driving on the highway* », in : Proc. of the European Prometheus Workshop on Intelligent Co-Pilot, p. 149–165, *Grenoble (FR)*, Dec. 1991.
- [206] M. HASSOUN, C. LAUGIER, « *Reactive motion planning for a car* », in : Proc. of the European Prometheus Workshop, p. 213–225, *Grenoble (FR)*, Dec. 1991.
- [207] S. JIMENEZ, C. LAUGIER, A. LUCIANI, « *Simulating physical interactions between an articulated mobile vehicle and a terrain* », in : Int. Conf. ORIA4th International Symposium on Offshore, Robotics and Artificial Intelligence, *Marseille (FR)*, Dec. 1991.
- [208] C. LAUGIER, A. IJEL, J. TROCCAZ, « *Combining vision based information and partial geometric models in automatic grasping* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, *Cincinnati, OH (US)*, May 1990.

- [209] T. FRAICHARD, C. LAUGIER, G. LIÉVIN, « *Robot motion planning : the case of non-holonomic mobiles in a dynamic world* », in : Proc. of the IEEE-RSJ Int. Workshop on Intelligent Robots and Systems, 2, p. 757–764, Tsuchiura (JP), July 1990.
- [210] C. LAUGIER, « *Planning robot actions under position and shape uncertainty* », in : NASA Conference on Space Telerobotics, Pasadena, Feb. 1989.
- [211] C. LAUGIER, « *Planning fine motion strategies by reasoning in the contact space* », in : Proc. of the IEEE Int. Conf. on Robotics and Automation, Scottsdale, AZ (US), May 1989.
- [212] C. LAUGIER, A. IJEL, J. TROCCAZ, « *Planning and executing sensory based grasping operations in a partially known environment* », in : Proc. of the Int. Symp. on Experimental Robotics, Montreal, QC (CA), June 1989.
- [213] T. FRAICHARD, C. LAUGIER, « *Planning movements for several coordinated vehicles* », in : Proc. of the IEEE-RSJ Int. Workshop on Intelligent Robots and Systems, p. 466–472, Tsukuba (JP), Sept. 1989.
- [214] C. LAUGIER, A. IJEL, J. TROCCAZ, « *Combining vision based information and partial geometric models in automatic grasping* », in : First Workshop on Multi-sensor fusion and Environment modelling, Toulouse (FR), Oct. 1989.
- [215] C. LAUGIER, P. THEVENEAU, « *Planning sensor-based motions for part-mating using geometric reasoning techniques* », in : Proc. of the European Conf. on Artificial Intelligence, Brighton (GB), July 1986.
- [216] C. LAUGIER, « *Traitement des incertitudes en programmation automatique des robots* », in : Journées Robotique, Sophia Antipolis (FR), June 1987.
- [217] C. LAUGIER, « *Les Apports respectifs des langages symboliques et de la CAO en programmation des robots* », in : Robotique et CFAO, La Grande Motte, Feb. 1985.
- [218] C. LAUGIER, F. GERMAIN, « *An adaptative collision-free trajectory planner* », in : Proc. of the IEEE Int. Conf. on Advanced Robotics, Tokyo (JP), Sept. 1985.
- [219] C. LAUGIER, J. PERTIN, « *Graphic simulation as a tool for debugging robot control programs* », in : First Int. Symposium on Design and Synthesis, Tokyo (JP), January 1984.
- [220] C. LAUGIER, J. TROCCAZ, « *Couplage d'un système de simulation de robot avec un terminal de synthèses d'images* », in : Première Colloque Image, CESTA, Biarritz (F), May 1984.
- [221] C. LAUGIER, « *Robot programming using a high-level language and CAD facilities* », in : Robotics Europe Conference, Brussels (B), June 1984.
- [222] C. LAUGIER, B. DUFAY, « *Geometrical reasoning in automatic grasping and contact analysis* », in : PROLAMAT, Leningrad (USSR), May 1982.
- [223] C. LAUGIER, « *Détermination automatique de prises d'objets à partir d'indices morphologiques locaux* », in : Proc. AFCET Reconnaissance des Formes et Intelligence Artificielle, Nancy (F), Sept 1981.
- [224] C. LAUGIER, « *A program for automatic grasping of objects with a robot arm* », in : Proc. of the Int. Symp. on Industrial Robots., Tokyo (JP), Oct 1981.
- [225] C. LAUGIER. – « *Les concepts liés à la caractérisation d'un dessin imparfait en CAO* ». – In : Actes du congrès de Reconnaissance des Formes et Intelligence Artificielle, AFCET-IRIA. – Toulouse, Sept 1979.
- [226] C. LAUGIER. – « *An approach to characterize ill-defined drawings in CAD* ». – In : EUROGRAPHICS 79. – Bologna, Italy, Oct 1979.
- [227] C. LAUGIER. – « *Illustration dynamique de programmes à l'aide d'une console de visualisation* ». – In : Panorama de la nouveauté informatique, Congrès AFCET-IRIA. – Nov 1976.

Invited Papers & Keynote Papers

- [228] C. LAUGIER, « *Will Future Robots Really Share our “Living Space” ?* ». *Singapore Robotic Games 2004 (SRG'04)*, Singapore, May 2004. Plenary Talk (without an original written paper).
- [229] C. LAUGIER, « *Towards “Automated Roads” : Some projects and New technologies* ». In *IEEE Int. Conf. on Intelligent Transportation Systems (ITSC 2002)*, Singapore, Sept 2002. Keynote paper.
- [230] C. LAUGIER, S. SEKHAVAT, L. LARGE, J. HERMOSILLO, AND Z. SHILLER, « *Some steps towards autonomous cars* ». In *Proc. of the IFAC Symp. on Intelligent Autonomous Vehicles*, pages 10–18, Sapporo (JP), Sept 2001. Keynote paper.
- [231] C. LAUGIER, C. MENDOZA SERRANO, AND K. SUNDARAJ, « *Towards a realistic medical simulator using virtual environments and haptic interaction* ». In *Proc. of the Int. Symp. on Robotics Research*, Lome (AU), Nov 2001. Invited paper.
- [232] C. LAUGIER, M. PARENT, « *Towards Motion Autonomy for Future vehicles* », in : *Robotics Research*, J. M. Hollerbach et D. E. Koditschek (éditeurs), Springer, 2000. Invited paper.
- [233] C. LAUGIER, D. D'AULIGNAC, F. BOUX DE CASSON, « *Modeling Human Tissues for Medical Simulators* », in : *Proc. of the IEEE-RSJ Int. Conf. on Intelligent Robots and Systems*, Takamatsu (JP), Nov. 2000. Invited paper.
- [234] C. LAUGIER, « *Motion autonomy and advanced man-machine interface technologies* », in : *Int. Conf. on Control, Automation, Robotics and Vision*, Singapore (SG), Dec. 2000. Invited tutorial.

- [235] C. LAUGIER, « Information Technology in Autonomous Vehicles », *in : Proc. of the Int. Conf. on Information Technology*, Damascus (SY), April 1999. Invited paper.
- [236] C. LAUGIER, M. PARENT, « Towards Motion Autonomy for Future vehicles », *in : Proc. of the Int. Symp. on Robotics Research*, Snowbird (US), Oct 1999. Invited paper.
- [237] C. LAUGIER, M. PARENT, « Towards a new Urban Transport System involving Automated Vehicles », *in : Actes de la conf. sur les Véhicules Electriques*, p. 146–150, Grenoble (FR), Nov 1999. Invited paper.
- [238] C. LAUGIER, P. GARNIER, T. FRAICHARD, I. PAROMTCHIK, A. SCHEUER, « Motion Planning and Sensor-Guided Manœuvre Generation for an Autonomous Vehicle », *in : Field and Service Robotics*, A. Zelinsky (éditeur), Springer, 1998, p. 60–67. Invited paper.
- [239] C. LAUGIER, « Towards autonomous vehicles for future intelligent transportation systems », *in : Atti del Sesto Convegno della Associazione Italiana per l'Intelligenza Artificiale*, p. 251–258, Padova (IT), Sept 1998. Invited paper.
- [240] C. LAUGIER, C. BARD, M. CHERIF, A. JOUKHADAR, « Solving complex motion planning problems by combining geometric and physical models : the case of a rover and of a dextrous hand. », *in : Algorithmic Foundation of Robotics*, K. Goldberg, D. Halperin, J. Latombe, et R. Wilson (éditeurs), Eds, USA, 1995. Invited paper.
- [241] R. HORAUD, C. LAUGIER, C. BARD, B. TRIGGS, « Integrating Planning, vision and visual servoing for automatic grasping », *in : Technology Transfer Workshop on Industrial Vision Autonomous Robots Medical Imaging*, Leuven (B), June 1994. Invited paper.
- [242] C. LAUGIER, « Solving complex task-level programming problems in robotics using physical modelling », *in : Automation'94*, Taipei (TAI), July 1994. Invited paper.
- [243] J. COUTAZ, J. CROWLEY, C. LAUGIER, « Apport de l'intelligence artificielle à la communication Homme-Machine », *in : Actes des 4èmes Journées Nationales du PRC-IA*, Oct 1992. Invited paper.
- [244] C. LAUGIER, « Autonomous robots in non-manufacturing applications », *in : Canada-France Workshop on Intelligent Robotics : The Dawn of Intelligent Robots*, Ottawa (CA), May 1992. Conférence invitée sans édition d'actes.
- [245] R. ALAMI, R. CHATILA, M. GHALLAB, C. LAUGIER, J. LAUMENT, « Robotique et intelligence artificielle », *in : Actes des 3èmes Journées Nationales du PRC-IA*, B. Bouchon-Meunier, Hermès, p. 411–473, 1990. Invited paper.
- [246] C. LAUGIER, « Planning robot motions in the SHARP system », *in : NATO Advanced Research Workshop on CAD-Based Programming for Sensory Robots*, Il Ciocco (IT), July 1988. Invited paper.
- [247] C. LAUGIER, J. LATOMBE, « Systèmes de programmation pour la robotique », *in : MICAD*, Paris (F), Feb 1985. Invited paper.
- [248] C. LAUGIER, J. TROCCAZ, « SHARP : A system for automatic programming of manipulation robots », *in : 3rd Int. Symp. on Robotics Research*, O. Faugeras et G. Giralt (éditeurs), MIT Press, Paris (F), 1986, p. 125–132. Invited paper.
- [249] C. LAUGIER, J. POUPLARD, « Systèmes de programmation des robots : Solutions industrielles et Problèmes militaires », *in : Journées Science et Défense "Vers la robotique théâtre d'opération"*, Toulouse (F), May 1985. Invited paper.

Technical Reports

- [250] M. YGUEL, C. TAY, K. MEKHNACHA, C. LAUGIER, « Velocity Estimation on the Bayesian Occupancy Filter for Multi-Target Tracking », *INRIA Research Report*, January 2006.
- [251] M. CHERIF, M. VIDAL, C. LAUGIER, « A Roadmap-based Algorithm for Planning Handling Operations in Changing Industrial Plants », *Research Report n° 3629*, Inst. Nat. de Recherche en Informatique et en Automatique, Feb 1999.
- [252] C. LAUGIER, V. A. YAKUBOVICH, « Universal Regulators for the Motion Control of Nonholonomic Vehicles », *Rapport scientifique du projet n° 97-01*, Institut franco-russe A.M. Liapunov, Univ. de Moscou (RU), June 1999.
- [253] C. LAUGIER, T. FRAICHARD, P. GARNIER, I. E. PAROMTCHIK, A. SCHEUER, « Sensor-based control architecture for a car-like vehicle », *Research Report n° 3552*, Inst. Nat. de Recherche en Informatique et en Automatique, Oct 1998.
- [254] UNIVERSITIES OF GENOVA, GRENOBLE, KARLSRUHE, LEUVEN AND OXFORD. – « SECOND : SENSory CONtrolled Dextrous robots ». – *Intermediate report, year 2*, Projet Esprit3-Bra Second 6769, June 1994.
- [255] M. CHERIF, C. LAUGIER, A. LUCIANI, « Projet SHARP : Operation Robotique Spatiale (Téléprésence) », *Research report*, Projet Région Rhône-Alpes, Grenoble (F), Nov 1994, Rapport de fin de contrat.
- [256] M. CHERIF, C. LAUGIER, A. LUCIANI. – « Projet SHARP : Opération Robotique Spatiale (Télé-présence) ». – *Rapport de fin de contrat, projet région rhône-alpes*, Grenoble (F), Nov 1994.
- [257] C. MILÉSI-BELLIER, C. LAUGIER, AL., « SECOND : SENSory CONtrolled Dextrous robots. Work Task 4.2, Grenoble Demonstration 1, and Work Task 2.1 », *Research report*, Projet Esprit3-Bra Second 6769, June 1993.

- [258] C. MILÉSI-BELLIER, AL. – « SECOND : SENSory CONTROLled Dextrous robots. Work Task 4.2, Grenoble Demonstration 1, and Work Task 2.1 ». – *Deliverable report*, Projet Esprit3-Bra Second 6769, June 1993.
- [259] C. LAUGIER, O. AL-CHAMI, A. IJEL, P. ADENIS, « Planification et contrôle d'exécution d'opérations de manipulation de pièces mécaniques par un robot mobile/manipulateur dans un contexte de maintenance », *Rapport final*, Contrat DRET, Dec 1993.
- [260] UNIVERSITIES OF GENOVA, GRENOBLE, KARLSRUHE, LEUVEN AND OXFORD. – « FIRST : Fundamentals of Intelligent Reliable Robot Systems ». – *Final report*, ESPRIT-BRA 3274, Feb 1992.
- [261] T. FRAICHARD, M. HASSOUN, C. LAUGIER. – « Projet Prolab II : Etat des réflexions et des spécifications ». – *Rapport*, EUREKA EU-153, Sept 1992.
- [262] O. AL-CHAMI, I. AMMAR, P. ADENIS, C. LAUGIER. – « Planification et contrôle d'exécution d'opération de manipulation de pièces mécaniques par un robot mobile/manipulateur dans un contexte de maintenance : études et réalisation du support de perception mobile ». – *Rapport final sur contrat DRET nN° 90041*, LIFIA, Nov 1992.
- [263] C. LAUGIER, O. AL-CHAMI, A. IJEL, P. ADENIS. – « Planification et contrôle d'exécution d'opération de manipulation de pièces mécaniques par un robot mobile/manipulateur dans un contexte de maintenance ». – *Rapport final*, Contrat DRET, Dec 1992.
- [264] C. LAUGIER, A. LUCIANI, S. JIMENEZ. – « La fonction simulation physique ». – *Rapport de fin de phase 3*, VAP-RISP, January 1991.
- [265] C. LAUGIER, A. LUCIANI, S. JIMENEZ, « La fonction simulation physique », *Research report*, Lab. d'Informatique Fondamentale et d'Intelligence Artificielle, January 1991, Projet VAP-RISP.
- [266] T. FRAICHARD, C. LAUGIER, « Smooth trajectory planning for a car-like vehicle in a structured world », *Research Report n° 1448*, Inst. Nat. de Recherche en Informatique et en Automatique, Unité de Recherche Rhône-Alpes, June 1991.
- [267] O. AL-CHAMI, L. DESHAYES, P. DI GIACOMO, C. LAUGIER, « Planification et contrôle d'exécution d'opération de manipulation de pièces mécaniques par un robot mobile/manipulateur dans un contexte de maintenance : études et réalisation du support de perception mobile », *Research report*, Contrat DRET no 90041, 1991, Rapport semestriel.
- [268] O. AL-CHAMI, L. DESHAYES, P. DI GIACOMO, C. LAUGIER. – « Planification et contrôle d'exécution d'opération de manipulation de pièces mécaniques par un robot mobile/manipulateur dans un contexte de maintenance : études et réalisation du support de perception mobile ». – *Rapport Semestriel No 1 nN° 90041*, DRET, Grenoble, July 1991.
- [269] UNIVERSITIES OF GENOVA, GRENOBLE, KARLSRUHE, LEUVEN AND OXFORD. – « FIRST : Fundamentals of Intelligent Reliable Robot Systems ». – *Reporting period : September 1990 - august 1991*, ESPRIT-BRA 3274, Sept 1991.
- [270] T. FRAICHARD, M. HASSOUN, C. LAUGIER. – « Copilote électronique pour un véhicule automobile : modules planification de trajectoires et contrôle d'exécution ». – *Rapport d'activité*, EUREKA EU-153, Dec 1991.
- [271] C. LAUGIER, E. MAZER, C. BELLIER, « Etude des systèmes mécaniques évolués, rapides et dotés d'intelligence artificielle : programmation automatique des mouvements d'un robot dans une cellule d'assemblage », *Research report*, Lab. d'Informatique Fondamentale et d'Intelligence Artificielle, July 1990, Rapport de synthèse finale sur convention de recherche DRET-LRP no. 87/160.
- [272] C. LAUGIER, E. MAZER, C. BELLIER. – « Etude des systèmes mécaniques évolués and rapides et dotés d'intelligence artificielle : programmation automatique des mouvements d'un robot dans une cellule d'assemblage ». – *Rapport de synthèse finale sur convention de recherche nN° DRET-LRP 87/160*, Contrat DRET, July 1990.
- [273] UNIVERSITIES OF GENOVA, GRENOBLE, KARLSRUHE, LEUVEN AND OXFORD. – « FIRST : Fundamentals of Intelligent Reliable Robot Systems ». – *First year progress report*, ESPRIT-BRA 3274, Sept 1990.
- [274] T. FRAICHARD, M. HASSOUN, C. LAUGIER. – « Copilote électronique pour un véhicule automobile : modules planification de trajectoires et contrôle d'exécution ». – *Rapport d'activité*, EUREKA EU-153, Dec 1990.
- [275] C. LAUGIER, « Geometric reasoning in motion planning », *Research Report n° 932*, Inst. Nat. de Recherche en Informatique et en Automatique, November 1988, 40 pages - Soumis à International Journal of Robotics Research (Juillet 1988).
- [276] C. LAUGIER, « Traitement des incertitudes en programmation automatique des robots », *Research Report n° 933*, Inst. Nat. de Recherche en Informatique et en Automatique, Nov 1988. 46 pages (no. 695-I IMAG).
- [277] C. LAUGIER, J. TROCCAZ, A. IJEL. – « Planification et exécution d'opérations de manipulation en environnement partiellement structuré ». – *Rapport nN° 85-198*, Rapport final sur convention DRET, Nov 1988.
- [278] C. LAUGIER. – « Geometric reasoning in motion planning ». – *Rapport nN° 932*, INRIA, Nov 1988.
- [279] C. LAUGIER. – « Traitement des incertitudes en programmation automatique des robots ». – *Rapport nN° 933*, Rapport de recherche INRIA, Nov 1988.
- [280] C. LAUGIER, « Influence du raisonnement géométrique dans le choix d'une prise d'objet », *Research Report n° 414*, Inst. d'Informatique et de Mathématiques Appliquées de Grenoble, Dec 1983. 81 pages.
- [281] C. LAUGIER, E. MAZER. – « Méthodes pour la programmation automatique des robots ». – *Rapport nN° 445*, Rapport de recherche IMAG, Nov 1984.

- [282] C. LAUGIER, C. EVIEUX, J. PERTIN-TROCCAZ, « Un système de simulation graphique de robots incluant une gestion élémentaire des incidents et des capteurs », *Research Report n° 421*, Inst. d'Informatique et de Mathématiques Appliquées de Grenoble, Grenoble (F), March 1984.
- [283] C. LAUGIER, J. TROCCAZ. – « La programmation graphique en robotique ». – *Rapport n° 82-219*, Rapports sur contrat ADI, Mars et Décembre 1984.
- [284] C. LAUGIER. – « La programmation des robots : expression textuelle et expression graphique ». – *Rapport n° 387*, Rapport de recherche IMAG, Juillet 1983.
- [285] C. LAUGIER. – « Le langage LM-GEO et la simulation graphique en robotique ». – *Rapport n° 82-219*, Rapports sur Contrat ADI, Mars et Décembre 1983.
- [286] C. LAUGIER, J. PERTIN. – « Automatic grasping : a case study in accessibility analysis ». – *Rapport n° 342*, Rapport de recherche IMAG, Dec 1982.
- [287] C. LAUGIER, « LISP-3D : logiciel graphique pour la manipulation et la visualisation de scènes tridimensionnelles », *Research Report n° 328*, Inst. d'Informatique et de Mathématiques Appliquées de Grenoble, Sept 1982. 38 pages.
- [288] J. LATOMBE, M. DYMETMAN, A. GRUMBACH, C. LAUGIER, A. LUX, E. MAZER, J. MIRIBEL, « Le projet PANDORE : Robotique et Intelligence Artificielle », *Research report*, Inst. d'Informatique et de Mathématiques Appliquées de Grenoble, Dec 1980.
- [289] C. LAUGIER. – « Visualisation d'objets tridimensionnels dans un contexte interactif ». – *Rapport n° 78-7-0389*, Rapport sur contrat DGRST, Juillet 1979.
- [290] C. LAUGIER, « Choix d'un matériel de traitement d'image adapté aux recherches menées en Robotique à l'IMAG », *Technical report*, Inst. d'Informatique et de Mathématiques Appliquées de Grenoble, Nov 1979.
- [291] C. LAUGIER. – « Etude de quelques problèmes liés à la saisie de données graphiques. Application à la saisie de dessins industriels à l'aide d'une tablette à digitaliser ». – *Rapport n° 78-129*, Rapport sur contrat IRIA, Dec 1978.
- [292] C. LAUGIER, Y. GARDAN. – « Implantation de GRIGRI sur le centre CAO de MICADO. Constitution d'une bibliothèque de sous-programmes 2D ». – *Rapport n° 78-129*, Rapport sur contrat IRIA, Dec 1978.
- [293] C. LAUGIER. – « Illustration dynamique de programmes à l'aide d'une console de visualisation : Utilisation dans un contexte pédagogique ». – *Rapport n° 75-050*, Rapport sur contrat IRIA, Mai 1976.
- [294] C. LAUGIER, F. MARTINEZ. – « Visualisation interactive de graphes - Graphes hiérarchisés et réseaux séries-parallèles ». – *Rapport n° 74-432*, Rapports sur contrat DRME, Juin 1975.
- [295] C. LAUGIER. – « Illustration dynamique de programmes à l'aide d'une console de visualisation ». – *Rapport n° 75-050*, Rapport sur contrat IRIA, Novembre 1975.
- [296] C. LAUGIER, A. LEDUC-LEBALLEUR, M. LUCAS, F. MARTINEZ. – « GRIGRI : Logiciel de base pour l'utilisation des consoles de visualisation graphiques ». – *Rapport*, Rapport de recherche IMAG, 1975.

Non Scientific Journals & Video Proceedings

- [297] C. LAUGIER, C. MENDOZA, « L'immatériel au bout des doigts ». *La recherche, Numéro spécial "Les nouveaux robots"*, Février 2002.
- [298] C. LAUGIER, G. DOBIAS, « Les technologies ITS au Japon ». *Transport/Environnement/Circulation*, (167) :15–24, 2001.
- [299] C. LAUGIER, F. MAUGIÈRE, J.F. BASSEREAU, M. STOLTZ, O. GAGNIÈRE, « Le toucher ». *La découverte*, no. 275, Feb 2000.
- [300] C. LAUGIER, J. TROCCAZ, « Comment faire saisir un objet par une main de robot ? », *Courrier du CNRS*, Feb 1993. Numéro spécial sur l'Informatique.
- [301] J. BOISSONNAT, C. LAUGIER, J. LAUMOND, « Planification de mouvements pour un véhicule planétaire », *Bulletin de Liaison de la Recherche en Informatique et Automatique*, 139, October 1992, p. 40–44.
- [302] I. E. PAROMTCHIK, C. LAUGIER, « Automatic Parallel Car Parking », In : Video-Proceedings of the IEEE Int. Conf. on Robotics and Automation., April 1997, Produced by Inria (3 min.).
- [303] I. E. PAROMTCHIK, C. LAUGIER, « Automatic Parallel Parking and Returning to Traffic », In : Video-Proceedings of the IEEE Int. Conf. on Robotics and Automation., May 1998, Produced by Inria (3 min.).

Softwares & Patents

- [304] C. COUE, C. LAUGIER, P. BESSIERE, TH. FRAICHARD, « Risque 1 : Method and related Devices for Vehicle Driving Assistance ». *Technology currently used in several industrial R&D contracts*. Patent no. 0552735. September 2005.
- [305] M. YGUEL, K. MEKHNACHA, C. LAUGIER, « Risque 2 : Improved Method and Devices for Vehicle Driving Assistance ». *Technology currently used in several industrial R&D contracts*. Patent no. 0552736. September 2005.
- [306] K. SUNDARAJ, C. LAUGIER, « 3D-Light : Library for the Interactive Simulation of 3D Animated Scenes ». *Internal use at INRIA Rhône-Alpes*. Software registered at APP (no. IDDN.FR.001.110026.000.S.P.2005...000.10000). February 2005.

- [307] K. SUNDARAJ, C. LAUGIER, « ColDetect : Collision Detection Library for Rigid and Deformable bodies ». *Internal use at INRIA Rhône-Alpes. Also available on our Web page.* Software registred at APP (no. IDDN.FR.001.280011.000.S.P.2004.000.10000). September 2003.
- [308] C. MENDOZA, K. SUNDARAJ, C. LAUGIER, « VisteoPhysic : Library for the Simulation of Interacting Rigid and Deformable Bodies using FEM and LEM models ». *Internal use at INRIA Rhône-Alpes. Also transfered to the XL-Studio company for an industrial application.* Software registred at APP (no. IDDN.FR.001.210025.000.S.P.2004.000.10000). June 2003.
- [309] K. SUNDARAJ, C. LAUGIER, « VDM : Library for the Simulation of Deformable Biological Tissues ». *Internal use at INRIA Rhône-Alpes. Also used at the Aesculap Company in a prototype system for Knee Arthroscopy.* Software registred at APP (no. IDDN.FR.001.280012.000.S.P.2004.000.10000). September 2003.
- [310] A. JOUKHADAR, A. DEGUET, C. LAUGIER, « AlaDyn3D : Dynamic Simulation Library for Deformable Bodies ». *Internal use at INRIA Rhône-Alpes during several years. Also available on our Web page.* Software registred at APP. 1998.
- [311] A. JOUKHADAR, C. LAUGIER, « ROBOT ϕ : Dynamic Simulation Library for Robotics ». *Internal use at INRIA Rhône-Alpes during 2 years. Also used by the GETRIS IMAGES company for an industrial application.* Software registred at APP. 1996.
- [312] C. LAUGIER, « LISP3D : 3D Graphics Library for LISP users ». *Internal use at IMAG Grenoble during several years.* 1979.
- [313] C. LAUGIER, F. MARTINEZ, « GRIGRI : Interactive Graphics Library ». *Internal use at IMAG Grenoble during several years. Also used in the CAD center of the MICADO company.* 1975.