The Diabetes is an illness that affects approximately 125 million people in the world. Due to the diets and current customs it is believed that it can reach between 300 and 400 millions in 2025. For this reason, research in this field monopolizes high percentages of the budget of health as well as of experts concern. At the moment no cure is known to this illness, so that the therapeutic target of the treatment of the diabetes is focused on the prevention of sharp and chronic complications by means of the maintenance of the glucemic profile between suitable limits as well as on improving the quality of life of the patients facilitating the administration of the insulin that allows to obtain a state of normo-glucemic. Chasing this target, the treatment of the diabetes has evolved from the classic therapy, based on multiple injections of insulin if the glucemic profile was trespassing certain limits, towards the intensive treatments based on continued infusion, that are possible thanks to the modern pumps of insulin infusion. Nevertheless the final target of the insulin treatment is to answer the needs of insulin in a dynamic way as it would be done by the organism of a healthy person. In this context arise the systems in "closed loop" characterized by automatic and dynamic modifications of the insulin model according to the actual glucemic profile of the patient. The new technologies of continued measurement of glucose allow to set up these systems, known also as "artificial pancreas", as a real alternative to the insulin treatment.

We have been working for a long time in the analysis of multitude of records of glucemic profile of diabetic patients, acquired by samples of capillary measure as well as of sensors of continue measurements. This has allowed us to go so far as to know in depth the variability of the glucemic profile according to the different implied factors: diet, dose and type of insulin, weight of the patient, etc. Likewise the study of the records of diet and insulin and the study of other patients notes in a data base has allowed us to acquire the necessary experience on the habits of the diabetic patient.

We have experience in the implementation of "patient's models" based on mathematical algorithms of compartimental type, widely used in the bibliography. Likewise we have designed an own model, based on neural networks, BG-ANN, capable of predicting with enormous precision the glucemic measure in 15 or 20 minutes, from records of glucose and insulin. The knowledge acquired on the habits of the patients has allowed us to generate simulated patients to prove the implemented models. The above mentioned models have been confirmed by records of real patients to validate their precision.

Finally we are working at a control algorithms based again on neural networks. The implemented prototype uses only glucemic records of a continued measurement sensor, the insulin doses administered that is provided by the bomb of continued infusion and the forecast realized by the model BG-NET. Tests carried out with this prototype, CG-NET, make to think that we are in a good way to implement a system of control in "closed loop".