**Introduction**

- **Patient’s Current Status (Diagnosis)**
  - Neural Network
  - SVM
  - Fuzzy-Genetic System
  - CART

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**Input Data**
- Patient’s data and other information related to the HF such as Age, Sex, Therapy, Etiology, Comorbidity

**System Output**
- Patient Name: John Smith
- Date: 4-12-2011
- Anamnestic Data: ...
- Instrumental Data: ...
- Current Status: Severe Heart Failure.
- Last Previous Status: Moderate Chronic Heart Failure on date: 29-11-2011.
- Worsening detected.
- Patient’s Trend: Moving toward a chronic condition with frequent exacerbations.

**Materials and Methods**

The AI functional block is trained using an anonymised database of 136 HF patients with varying severity degrees. The patients are treated by the Cardiology Department of the Hospital Santa Maria Nuova in Florence, Italy. Patients’ data are related to the period 2001-2008.

**Results**

**CAD System**
- Neural Network
- SVM
- CART
- Fuzzy-Genetic

**Follow-up analysis**
- Improvement
- Worsening
- Stable

**Score Based Prognosis**
- SHF
- ADHERE
- CHARM
- EFFECT

**Output**
- A three level HF current severity assessment: Mild HF - Moderate HF - Severe HF
- Improvement
- Worsening
- Stable
- Survival probability in the next days/years

**Discussion e Conclusions**

The major uncertainties occur in the "Moderate HF" classification level, as shown in the confusion matrix.

The ideal scenario for this system is monitoring HF patients with regular parameters measurement at home, by nurses with a multi-parameter device, or at the GP’s surgery. With proper training, the system can also operate in a continuous monitoring scenario using wearable devices.

With this system the patient HF status can be assessed also by non-specialists physicians (nurses, GPs). The design and implementation of the CAD function for the prediction of future destabilization is also underway.