

## THE MULTITASK CLASSIFICATION ALGORITHM FOR COMPUTER- AIDED DIAGNOSIS OF COPD

<sup>1</sup>Edward Puchała, <sup>2</sup>Maria Magdalena Bujnowska-Fedak, <sup>3</sup>Iwona Pirogowicz

<sup>1</sup>Department of Computer Systems and Networks, Wrocław Technical University, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland, edward.puchala@pwr.wroc.pl

<sup>2</sup>Department of Family Medicine, Wrocław Medical University, Syrokomli 1, 51-141 Wrocław, Poland, mbujnowska@poczta.onet.pl

<sup>3</sup>Department of Hygiene, Wrocław Medical University, Mikulicza-Radeckiego 7, 50-435 Wrocław, Poland, iwapir@wp.pl

**BACKGROUND:** The fast and precise diagnosis of patients with COPD is one of the key elements of successful management of the disease. The possibilities of using multitask pattern recognition algorithms for computer-aided diagnosis of COPD were presented.

**METHODS:** The algorithm is particularly useful in situations when an object undergoes several classification tasks. For example, such a situation is typical for compound medical decision problems where the first classification denotes the answer to the question about the kind of disease, the next task states recognition of the stage of disease, the third one determines the kind of therapy, etc.

**RESULTS:** The developed algorithm was tested on the real clinical data of 214 patients of General Practitioners (GPs) practices in Lower Silesia District to make comparative analyses. The entire data set was divided into two parts: I- the learning set (150 patient medical records) and II - the testing set (64 patient medical records). As an algorithm quality criterion, the index of correct classification was taken into account (0,77-0,84).

**CONCLUSIONS:** The implementation of computer-based medical decision systems can help of diagnosis of patients, offering faster service. GPs are able to manage patients across a broad spectrum of COPD conditions with the computer's (non-physicians) assistance.