

# MEDICAL IMAGE SEGMENTATION USING METHODS OF DISTRIBUTED AGENTS

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## PROPOSED METHOD

- Centralized multi-agent system
- System combines several types of basic image information
- Agents are controlled by a moderator
- Reactive agents with memory

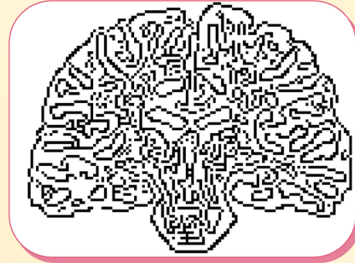


## INPUT IMAGE



## EDGE IMAGE PREPROCESSING

- Expansion of the brightness range
- Adaptive threshold, canny detector



## REGION IMAGE PREPROCESSING

- Expansion of the brightness range
- Clustering, contour analysis



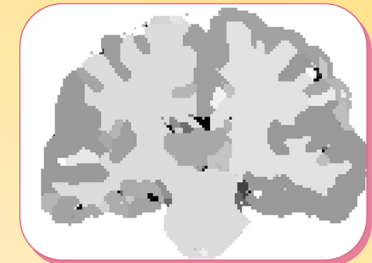
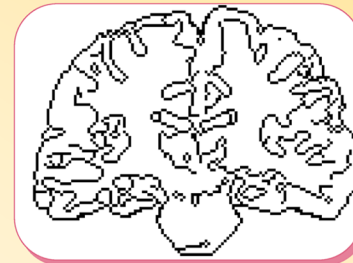
## AGENT START IMAGE CREATION

- Edge image and region image intersection



## EDGE POSTPROCESSING AND REGION FILLING

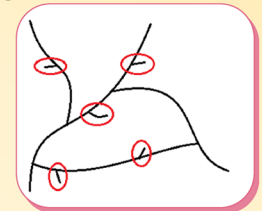
- Skeletonize, edge repair using modified "bubble" method
- Growing regions, calculating average values of brightness, edge filling



## WORK OF AGENTS

- Move, copy, create new edges, destroy existing edges, die
- Agents use our own heuristic function:

$$ps = am * ca + rm * cr + em * eTP + pm * ep$$



## AGENT INITIALIZATION

- Agents are initialized on the ends of edges
- Agents are initialized on the crossings

