5) Непосредственная реализация рассмотренной схемы МРС-стратегии не гарантирует устойчивость по Ляпунову движения объекта, что требует принятия специальных мер по её обеспечению.

В рамках данной работы были рассмотрены два метода регулирования систем автоматического регулирования на примере системы перевернутого маятника.

**Литература**
2. Андреевский Б. Р., Фрадков А. Л. Избранные главы теории автоматического управления - Спб.: Наука, 1999.

**DEVELOPMENT OF THE EQUIPMENT MONITORING SYSTEM**
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**Introduction**
*(Problems in equipment monitoring)*

Possession of equipment like possession of anything is supposed to be controlling. Controlling on equipment implies check of availability, position, state, guarantee, level of usage and so on. But now such controlling is connected with some difficulties in many companies. Often paper documents are used. And it takes much time to do any request like checking availability or getting information about guarantee, location, owner and so on. Often the way of doing it is not as convenient as people want it. In case company is quite big, that means it has many division or equipment units, equipment monitoring is getting more difficult. There may be more then 100 equipment units for 1 responsible person. Moreover this equipment can be owned by another person. It means formal accounting doesn’t reflect the actual situation. Complication of monitoring is that there are many states of equipment. State depends on stage of life cycle and state’s attributes in 1 state. Let us have a look at life cycle of equipment.

**Life cycle of equipment**
First company which wants to buy equipment announces tendering. Then winner of tender delivers equipment. Then equipment is registered. Then equipment is put into operation. Then it is used. At the end equipment is struck off the register.

Often to solve the task of equipment monitoring the “accountant’s approach” is used. But it includes only 2 stages: registration of equipment and striking off the register. For better monitoring it needs reflection in system as many processes as it’s possible. That’s why it needs the system supporting all stages. Let us have a look at the existing systems.

**Existing technical solutions**
Criterions were got for evaluating the existing technical solutions. Criterions were based on tasks of life cycle’s steps. Those are history (logging) of equipment, statistics, visualization, information support of each life cycle’s stage., search in database, report service, web-interface and reminder of equipment events.

3 solutions have been found in the internet:
Irwin invent[1], 1С: Учёт оборудования[2], Simple Soft: computer monitoring[3].
Each found solution has their own features:
Irwin invent is specialized in networking. Supports history, life cycle, search in db, report service, reminder.
1С: Учёт оборудования supports life cycle, search in database. But it is specialized in barcodes.
Simple Soft is specialized in computers. Supports search in db, reminder.

There is no system which covers all criterions. So it’s reasonable to make system covering more people’s demand. So it would be more useful and demanded. Creation system demands knowledge of system requirements and user groups.
Table 1. The existing solutions

<table>
<thead>
<tr>
<th>System</th>
<th>History</th>
<th>Statistics</th>
<th>Visualisation</th>
<th>Cycle Life</th>
<th>DB Search</th>
<th>Report Service</th>
<th>Web Interface</th>
<th>Reminders</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRWin Invent (Only for networking)</td>
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<tr>
<td>1С: Учёт оборудования barcodes.</td>
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<td>SimpleSoft: Computer monitoring</td>
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<tr>
<td>EMoSy(My future system)</td>
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</table>

**System Requirements**

The developed system has to give users such possibilities as:
- Storing information about equipment in DB
- User registration
- Granting users appropriate rights.
- Users authentication
- Web-access
- Support for data integrity
- Simple user interface
- Access according to rights (Role).
- Reliability
- System must still be working with 100 users.
- Resistance to degradation. Performance of the system shouldn’t decrease over time.

**User groups (Roles)**

Here are user groups and their main functions.

**Administrator:**
Person who monitors and controls the system.

**Owner:**
Person who possesses equipment without a broker.

**Responsible person:**
Person who is responsible for equipment. In company documents this person is marked as responsible person.

**Spectator:**
Person who can watch the activity of several people (associated list) and their equipment.

Their functions you can see in site structure in figure 2 below.

**Application Architecture**

“Accounting department” with its self or with “administrator” adds information about equipment using either “Sql stream import” or “Interface for adding data”. All information is stored in database. Access to the database can be got via web-application. Web front end includes 4 interfaces.
Description of the interfaces:
- Interface for adding data.
  Allows to add new equipment in data base or to change stage of life cycle. Scanned document can be load for each stage to prove that equipment is at this stage.
- Interface for “owner”
  Allows to view information about equipment, registered for this “owner”. Allows to search with parameters among the equipment registered for this “owner”.
- Interface for “Responsible person”
  Includes interface for “owner”. Allows to see history of owners.
- Interface for “Spectator”
  Allows to view information about equipment registered for “Responsible persons” associated with this “Spectator”.
- Interface for Administrator
  Allows to grant users rights. Allows to register new users. Includes interface for adding data. Includes interface for “spectator”.
  It should be noted that the structure is not static and may be modified in the future.

Conclusion
The future system is intended to satisfy requirements of users, to cover all life cycle, to cover fields that are not covered by existing systems.

At the present situation big part of system is realized. That is interfaces for “owner”, “responsible person”, “administrator”. The rest is interface for “accounting department”, statistics possibilities, purchasing system and history. Site structure is represented in figure 2.
Figure 2. Site structure.

The structure of system is built in the way new modules can be added. There are many directions to go to. That is rating of suppliers, rating of equipment, levels of usage of different equipment, this system can be developed as 1 system for several companies with web access.

References
[2] 1C’s site. URL: http://www.1c.ru

AVТОМАТИЗАЦИЯ И ОПТИМИЗАЦИЯ ПРОЦЕССА СЕГМЕНТАЦИИ ТОМОГРАФИЧЕСКОГО ИЗОБРАЖЕНИЯ

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Введение
Технология компьютерного зрения находит применение во многих областях современной промышленности. Как научная дисциплина, компьютерное зрение относится к теории и технологии создания искусственных систем, которые получают информацию из изображений. Примерами применения таких систем могут быть:

- Системы управления процессами (промышленные роботы, автономные транспортные средства)
- Системы видеонаблюдения
- Системы организации информации (например, для индексации баз данных изображений)
- Системы моделирования объектов или окружающей среды (анализ медицинских изображений, топографическое моделирование)
- Системы взаимодействия (например, устройства ввода для системы человеко-машинного взаимодействия)

Одним из направлений технологий компьютерного зрения является выделение объектов по определенному признаку из общей картины.

В данной работе рассматривалась обработка томографических снимков, предоставленных институтом синхротронного излучения (ISS) технологического института Карлсруэ КГТ (Карлсруэ, Германия). Основной задачей при обработке изображений являлось выделение объекта и определение его местоположения относительно центра.