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CONSTRUCTION OF DATABASE
FOR THE OCT DEVICE

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1. Introduction

A new application of the optical coherence tomography (OCT) for the analysis of skin micro-structure in real time has been recently developed [1, 2]. At present a compact system for non-invasive imaging of human tissues in vivo is under construction.

In this report we present the OCT database destinied for storing and management the information about patients, their lesions and tomograms. It was developed in the framework of Microsoft Access 97 using Visual C++, Visual Basic and Quick Camera application.

2. Database stucture

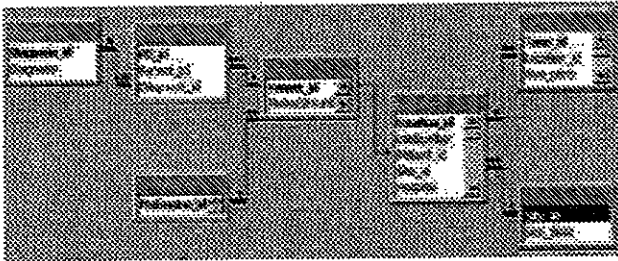Figure 1 shows the database structure.

Figure 1: Structure of the OCT database

The database includes 7 tables:

1. Patients

2. Location

3. Tomo

4. Site

5. Professions

6. Diagnosis

7. Patients&Diagnosis

Table **Patients** is used for storing information about patients. It includes the following information concerning each patient:

1. Protocol number

2. Family name

3. First name

4. Date: it is the date of registration

5. Sex

6. Date of birth

7. Race

8. Address

9. City

10. Telephone

11. Phototype

12. UV-explosure

13. Displastic Naevi S

14. Profession

15. Smoker

16. Photo of patient

17. Date of next consultation

18. Other diseases

19. Remarks

Table **Location** is used for storing information about lesions of patients. It includes the following information concerning lesion:

1. Lab number

2. Patient

3. Site (from which part of the body the lesion is)

4. Hospital

5. Examiner

6. Biopsy

7. Photo of lesion

8. Histological diagnosis

9. Clinical diagnosis

10. Date (of taking the lesion)

11. Assymetry, Border, Darking, Growthing, Haemorrhage, Itching, Regression, Satellite, Ulcer, Circumferrence, Diameter

12. Remarks

Table **Tomo** is used for storing information about tomograms of lesions. It includes the following information associated with tomogram:

1. Vivo

2. Depth

3. Length

4. Photo of tomo

5. Remarks

Table **Site** contains a list of possible sites concerning the location of lesions.

Table **Profession** supports a list of professions. The user can add additional professions to the list. All professions are divided into two parts: A and B. A means the profession connected with sun, and B is not.

Table **Diagnosis** maintains a list of possible diagnosis of each patient. The user can add additional information to this list, in the case if there is no the specific diseas in the list.

3. Forms for putting information into database

There are several forms for putting the information into the OCT database:

1. **Patients**

2. **Lesions and Tomos**

3. **Tomo**

The form **Patients** is for putting the information concerning a concrete patient. This form is presented in Fig. 2.

The form **Lesions and Tomos** are for putting the information concerning the lesions and tomograms for each patient. This form is presented in Fig. 3.
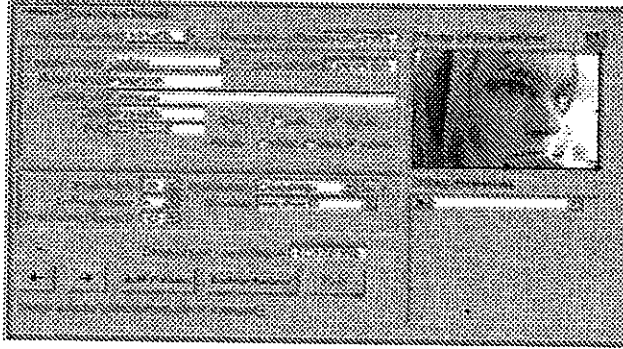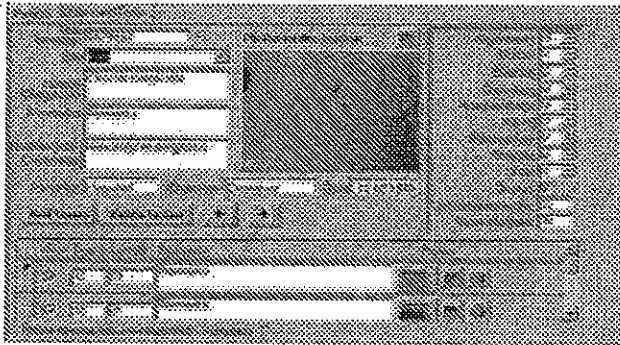
Figure 2: Form **Patients**

Figure 3: Form **Lesions and Tomos**

4. Insruction for usage the OCT database

To manage the OCT database one have to do the following steps:

1. Open OCT.mdb in Access.

2. Click the button **Start** for opening the forms.

3. Enter all necessary information about the patient into the form **Patients**, including the photo of patient and the diseases which can be choosen from the list of deseases.

4. Use button **Add Patient** for adding new patient into the database, and button **Delete Patient** to remove a patient from the database. For moving throw the patients use buttons shown in Fig. 4.

One can find the particular patient by **Protocol number** and/or by **Family name**.

Figure 4: Buttons for patient search

When all information concerning the form **Patients** is entered into the database, one have to fill forms **Lesions** and **Tomos**: a) enter the information about lesion including the photo, b) add tomograms concerning the lesion.

After finishing the mentioned above steps, the form **Tomo** (see Fig. 5) can be opened by pressing the button **Tomo**.
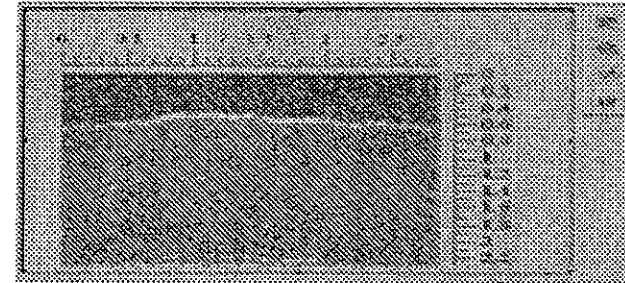

Figure 5: Form **Tomo**

From this window, after putting the tomogram into the database, one can run different OCT applications. For instance, the button **Filter** can be used for filtering the tomogram image [3].

The result information concerning the patient can be represented in the printed form by pressing the button **Print**. The form of the printed report is shown in Fig. 6.

Use the button **Exit** in the form **Patient** to exit from the OCT database.

Conclusions

The OCT database was tested with the Quick Camera and the touchscreen. It was incorporated into the OCT code and tested altogether: images of patients and lesions were taken by digital camera, tomograms were produced by the OCT device.
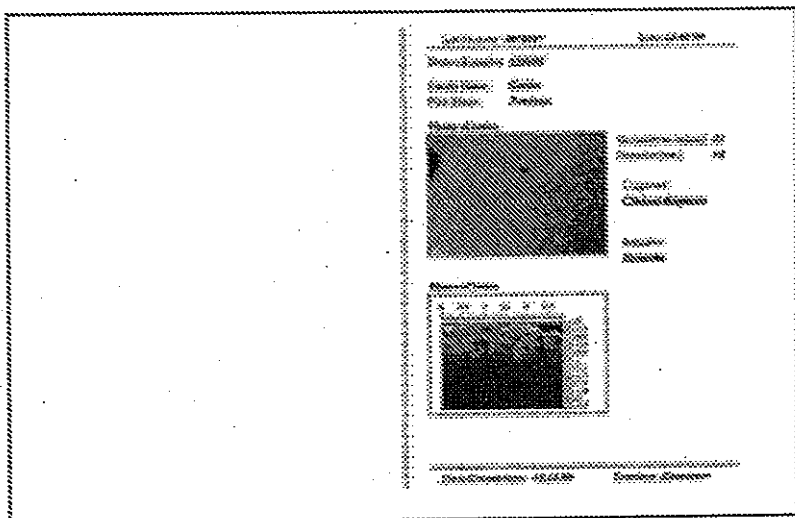
Acknowledgements

Figure 6: Form of printed report

References

[1] Gelikonov V. et al, in Conf. on Lasers and Electro-optics, v. 9, 1996 OSA Technical Digest Series (Optical Society of America, Washington D.C., 1996), p. 58.

[2] Sergeev A.M. et al, in Advances in optical imaging and photon migration, OSA series TOPS, v. 2, 1996.

[3] Akishin P.G., Akishina E.P., Akritas P., Antoniou P., Ioannovich J. and Ivanov V.V.: *"Filtering Digital Images of Human Skin Micro-Structure"*, Presented at the First International Conference "Modern Trends in Computational Physics", June 15-20, 1998, Dubna, Russia. Submitted to "Computer Physics Communications".

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