Fingerprint biometrics in service public health system at birthplaces

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Abstract— **This article presents totally new system of biometric identification and baby identity guarantee, based on fingerprint minutiae that are formed prenatal at humans.**

Exclusive, we are presenting qualitative research as proof that baby has fingerprint which can be acquired, stored, encrypted and, above all, it can guarantee its identity. We enrolled testing baby minutiae on every possible type of fingerprint scanners and determine which one is optimal for this purpose. With that we formed hard basic to develop our research further more.

This new system can prevent any possible steal or ID replacement in birthplaces, worldwide! In countries such as SAD, Japan, Switzerland that have high level public health it can provide new, higher level, of public health level and give their citizens better health service.

I. INTRODUCTION

Large human problem nowadays in birthplaces worldwide with potential to make bigger problem is baby switch in birthplaces or baby steal identity. According to B. Gille study, from 4 million newborn babies in the world 28.000 from them have been replaced. This is great society problem and it is happening today, in every country in the world. We are preparing to solve this great problem with totally new system based on fingerprint minutiae of newborn baby.

Main question was: Can baby fingerprint provide enough quality fingerprint and second can it be acquired? By making this research we provide answer to these questions and give basic to improve our research to other colleagues in fingerprint biometrics.

What type of scanner is optimal for such job and how it can be realized? We have answers on these questions and in this work it will be shown.

II TECHNICAL SOLUTION

First step was to make prototype of our patent device. It is dual fingerprint scanner that scans two fingers, both mother and baby at the same time.

The device will be slightly different from today's existing classical fingerprint scanners, thus it would have two fields for scanning fingers of two different persons (a mother and the baby). Those two fields for scanning can be physically divided during the process of device construction or they can be mapped by software definition on scanning surface as existing scanners possess. It will be really effective device, since it is highly practical and easy to work with, easy to control and to manipulate. The device maintenance is easy, classical and similar like other the one for fingerprint scanners. Beside its common purpose and scanning two fingers of different persons at the same time it will provide a unique ID reference (similar to Primary Key) which will be the base for every pair of a scanned mother-baby pair.

Figure 1 shows front view of the patent device that we have prototype for. We can see all elements needed.
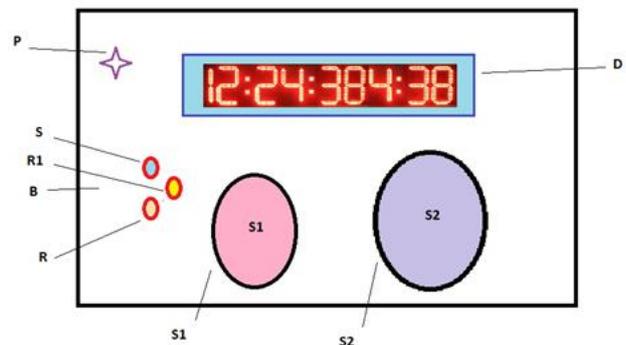

Figure 1 - shows front view of the patent device

Device works as putting P in position on the device gives us an information on the display that device is in function regularly and there are no errors. Pressing S button makes the fingerprint scanning on both fields of the device start (S1 and S2) simultaneously, requiring placing the fingers of a mother and the baby.

After scanning and pressing R1 button the data will be stored and unique ID reference is shown on display D. ID reference can be both numeric and alphanumeric, considering that the numeral systems it can be octal, decimal, binary or hexadecimal. The main fact is that ID is unique.

III RESEARCH

Research that we can provide is all 10 scanned fingers from new born baby and compared based on results. These results are shown on figure 2 and represented our qualitative jump in fingerprint biometrics research.

We provide those results exclusively and we expect somebody to make further steps in providing deeper research in this field based on this results.

attempt / scanner type	Optical	Capacitive	Preasure	Thermal
Finger 1	10	7	3	2
Finger 2	10	6	2	2
Finger 3	10	6	2	1
Finger 4	10	5	1	0
Finger 5	9	4	0	0
Percentage of success	98,00%	56,00%	18,00%	10,00%

Figure 2 – Scanned baby fingerprint on various scanner types

Using all these facts, device, research results and existing fingerprint scanners we develop totally new system that will guarantee baby identity for each new born baby. Also we guarantee parenthood over each baby and enable that every parent leave birthplace with its own baby.

Existing devices scan one or more fingers of one person only, we are emphasizing the fact that it is only one person, and there are no fingerprint scanners which scan fingers of two different persons at the same time using one device, especially not devices which make unique ID reference during scanning which will be connected with the record of fingerprint scanned and stored data.

Many researches done fingerprints minutia of fetus, ultra waves and biometry scanning the minutiae on each finger are formed by the end of 7th month of pregnancy. It is important to say that babies born before regular time of birth, during 8th, and especially by the end of 7th month of pregnancy have fingerprint on each finger, both hands and foots fingers already formed and we can use it to guarantee identity.

This scientific fact is essential for this device, this research and the realization or the Project that will provide a qualitative leap in gynecology and midwifery and nursing in every maternity all over the world.

In fingerprint ridges and valleys are the only biometry that is formed prenatally and it can be used for the purpose for ID baby. The idea for Patent Innovation is based on this scientific fact confirmed by both Biometry system as Computer science and gynecology – midwifery as a branch of HealthCare protection system.

Here we cannot use other biometrics such as Iris recognition because it is unstable. Main question is: **Why?** Well, until 4th year at humans the pigmentation in children's eye is changing and becoming different that is main reason. The shape and color both change which makes it impossible to be used for this purpose and for fulfill this purpose.

MILESTONES GAINED FROM PATENT

- we got proof and evidence of parenthood for every newborn baby
- we have no possibility replacing or stealing identities of newborn babies
- all parents got safety
- device is compact construction and practical handling throughout the process
- device has its own energy supply with batteries
- device has small size, low weight and it is portability
- has good price/quality ratio
- also device is ambient and environmental friendly
- wide range of application and usage.

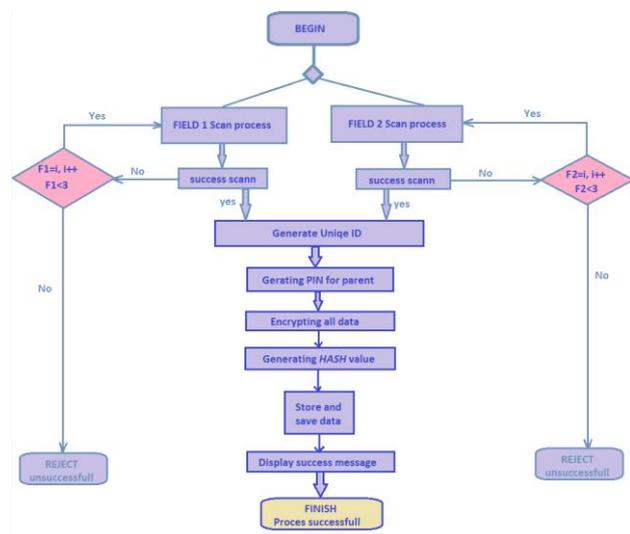Figure 3 represent our Data acquisition algorithm for enabling baby minutiae stored and encrypted.

Figure 3 – Data acquisition algorithm

After starting device and choosing option 2, software initializes Agrogithm2 – Algorithm for checking identity of parenthood-maternity. Figure 3 shows all functionality, logic and behavior of this algorithm. Based on figure preview the conclusion can be derived about the possible usage of both cases and a sequence diagram of procedures and activities of software.

Data algorithm is provided by pseudo code here to show his functionality and to provide logic in this process.

IV CONCLUSION

We made break throw, we did it first and we prove that it is possible to guarantee babies identity based on their fingerprint. Baby has its own ID!

Now it can be shared and spared on different ways in different areas of social and Health Care systems. System is highly modular, it can be updated and what is most important, it can be a base for some future development in the area of Biometrics systems. Patent device can be applied in dozen countries in a fight against the organized crime and help prevent thefts or replacements of newborn babies, especially in territories with low IT infrastructure and technological development.

Every type of Biometrics tries to minimize both FAR and FRR in attempt to be much more accurate and secure. This device has accomplished that part since it combines two scanned data and its accuracy grows exponentially.

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