



BOOK OF ABSTRACTS ICCGANT University of Jember Indonesia 2017



**THE FIRST INTERNATIONAL CONFERENCE
ON COMBINATORICS, GRAPH THEORY AND
NETWORK TOPOLOGY**

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Early Detection Of Autism Using Forward Chaining Method

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Abstract. Early diagnosis of autism disorders in the children growth process is very important. However, public and parent are still have limited knowledge about autism, such as people with autism experience discrimination and their family have limited information about the treatment therapeutic process. Moreover, the expert systems as part of informatics engineering application could be useful to solve the autism problems. The use of expert systems will be easier using android-based applications. Our literature reviews show that there is still limited research regarding to the application of forward chaining method for autism early detection. Therefore, this research aims to diagnose children in the autism disorder by detecting the type of disorder using forward chaining method. Hopefully, this research makes contribution by applying the forward chaining method using android-based application into early detection of autism disorders. This research has implications for theory and practice. For theory, the results of this research can be added to the body of knowledge of expert systems and autism fields. Furthermore, for practice, the patient, their family, doctor and the other relevant stakeholders could use the android application for autism problems.

Keywords : Autism, Forward Chaining, Diagnosis, Expert System, Android.

CERTIFICATE

We acknowledge that
Muhammad Ali Syakur
Universitas Trunojoyo Madura

*Has participated as a
PAPER PRESENTER*

**IN THE FIRST INTERNATIONAL CONFERENCE
ON COMBINATORICS, GRAPH THEORY
AND NETWORK TOPOLOGY**

entitled

Early Detection Of Autism Using Forward Chaining Method

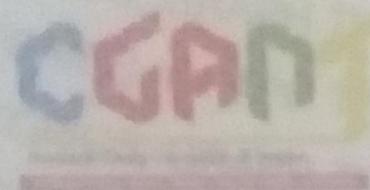
University of Jember - Indonesia, 25 -26 November 2017

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Keywords: Autism, Forward Chaining, Diagnosis, Expert System, Android.

1. Introduction

Autism is a condition of a person from birth or infancy at the moment, which made him unable to form a normal social relationships or communication. According to data from the UNESCO in 2011, there are 35 million people with disabilities autism around the world. On average, 6 of 1000 people in the world have suffered from autism. In the United States, 11 of 1000 people are suffered from autism. In comparison, 8 out of every 1000 people of Indonesia are suffered from this problem. Furthermore, public awareness about autism is still low. People with disabilities autism discriminated and their family do not know where to seek help for therapy. People in big cities have started to know about autism. However, many people in several areas still do not understand about autism and have no means for handling the autism people.

In the previous studies with the title "Architecture Application expert system to diagnose the disorder of autism Early in children" has produced a web-based intelligent system application using Certainty Factors. Whereas in other research use Forward Chaining (FC).Expert system has been used for diagnosing the Illness ' Atherosclerosis ' using atherosclerosis method of Forward Chaining. Moreover, other research is going to make an expert system to diagnose autism in children with Certainty Factor method. Forward Chaining (FC) search method or technique of tracking ahead starting with the information and the incorporation of the rule to generate a conclusion or goal. (Russell Norvig, p. S, 2003). FC is very good if it works with problems that started with the recording of the initial information and wants to achieve a final settlement because the whole process will be done sequentially.

2. Theoretical foundations

2.1. Autism

Autism is a developmental disorder which appears early in the life of a child that is characterized by an inability to relate to others, the problem in terms of communication, and the presence of certain behavior patterns that are repeated. Children with autism disorders in passing does not seem problematic. Physically they grow like a normal child in his age. But if you check more depth then it will be seen that they have a delay in the expansion of (especially in terms of language) and they show the strange behavior that are not commonly performed by children in his age, such as often move their hands, moving in circles, or often look with the angle of the eye). Child autism disorder has characteristics as following: delay of the presence development, good communication, development of unbalance motoric, as well as in social interaction. (Rini Hildayani, et al, 2010). Android is a Linux-based operating system for cell phones like Smartphones and tablet computers. Android provides an open platform for developers to create their own applications to be used by various moving devices.

2.2. Classification of Autism

According to Orphans (2002) in YAI, autism children can be classified into three groups as following:

1. Perception of Autism: It is an original autism because the disorders happened since before born. The inability of children speaking in reaction to irregularities including on stimulation from the outside, as well as the ability of the children in collaboration with others.
2. Reaction autism: reaction occurs due to some problems that make stressful such as the parent is passed away, heavy sick, moving house/school and others. This autism will have certain recurring movements and sometimes accompanied by convulsions. These symptoms appear at the age of six to seven years before the child move to the stage of thinking logically.
3. Later Autism: the abnormalities in the brain network happened after the child is born and growing. This will be difficult in terms of administering training and educational services to change their behavior that is already attached.
 - 1) Infantile Autism: autism or childhood, procedure in the introduction of the autistic children characteristics above 5 years old. The development of a child's brain would be very slow. The ideal age is 2-3 years old because the child brain development at this age is the quickest.
 - 2) Asperger Syndrome: it is similar to infantile autism in terms of less social interaction. But they are still capable to communicate pretty well. Children often show their unreasonable behavior and limited interest.
 - 3) Attention Deficit Hyperactive Disorder (ADHD). It can be translated with disruption of focusing Concentration and Hyperactivity or GPPH. Hyperactivity is the overload motoric behavior.

2.3. Forward Chaining method

Forward chaining or fore led tracking data (data-driven). In this approach, tracking starts from the input information and then try to get tracking conclusion looking for the fact that fit with the rules of the IF part of the IF-THEN rule. (Arhami, 2005).

2.4. Literature review

- a. Widya Kusumawati (2014), which performs research about the expert system to diagnose children with Early Autism Disorders using Forward Chaining Web-based method. In this research, classification of autism disease symptoms and then categorization of autism disease have been conducted.
- b. Journal of Forward Chaining Application On Autism Child Sufferers Diagnosis Program, Gusti Ayu Kadek Tutik A Pomegranate, Umi Rosma, Proboyekti (2009), which explain about the development of an application to help parents for doing the initial diagnosis of the autism possibility in children. Knowledge in the system is represented in the form of rule or Forward Chaining. Output in the system consists of autism possibility in a child based on the facts/symptoms that is given to the system.

- c. Anton Setiawan Honggowibowo (2009) who is doing research on the expert system of diagnosis of disease of rice plant-web based using Forward and Backward Chaining. In this research, the web-based expert system which has been developed using rule base (rule-based reasoning) with and forward chaining inference method and backward chaining to help farmers diagnose rice plant disease.
- d. The expert system of Home Program for children with Autism using Forward Chaining Web-based method, Rakheena, Julian Findawati (2015). In the making of the expert system, facts and knowledge that related to symptoms in children autism sufferers will use in taking a conclusion. Those facts and knowledge are obtained from the results of the interviews with the internet experts and others. Each spectrum will be made for every possible combination at least 5 symptoms, then the autism types will be specified as well as sort of home therapy program that fit for each child.

2.5. Early Detection and Prevention of Child Autism

Symptoms are generally can be traced to 2.5 years old as early detection. In the case of autism infantile (Autism disorders that occur in children from birth), which Leo Kanner suggested that children at four months old of autism behavior that has been different with normal children(The Hadis, 2006:57). In general, clinic characteristics generally that found in children autism according to Yatim (2007) includes the following: 1. Very slow in language development, less use of language, then the use of abnormal words, 2. Very slow in understanding social relations, often avoiding eye contact, often be alone, and lack of interaction with the surrounding environment, 3. Marked with the limitation of activity and interest, the autism children show repeated body movements, such as clap their hands, swirling, twist or look at an object continuously. 4. The unbalanced pattern of the mental and intellectual function, autism children are sensitive to the environmental change, and react emotionally. Intellectual ability mostly declines or low intelligence and about 20 percent have intelligence above the average. 5. A small percentage of autistic children show a very deviated behavior problems, such as hurting themselves or attacking others.

2.6. The causes of Child Autism

Some of the latest theories explain that genetic factors have important roles in autistic problems. Twins Baby with one egg will have an autistic disorder similar to his twin brother. Also, several children in a family or in one large family experiencing the same disorder. In addition to the influence of viruses like rubella, toxo, herpes, fungus, bad nutrition; bleeding; food poisoning; in the pregnancy can inhibit the growth of brain cells that lead to the problem with baby's brain, especially understanding, communication and interaction functions.

Lately research on the relationship between also revealed digestive disorders and autistic symptoms. It turns out that more than 60% of autistic persons have a digestive system that is less than perfect. The food in the form of cow's milk (casein) and wheat flour (gluten) non-tercena perfectly. The second protein from food is not everything changed into the amino acids but also be peptides, a form of short chains of amino acids that are supposed to be disposed of via the urine turns on the disabled, autistic, peptide are reabsorbed by the body, enters the bloodstream, go to the brain and creating brain function is impaired. Brain function is usually affected cognitive functioning, receptive, attention, and behavior.

Autistic patients usually lose their of the ability of the immune system so inflammatory happens. A cytokine has been overproduced in the white blood, the level is increasing and make the abnormal neurology happened. The experiment has been conducted about the influence of gluten and casein into food that will be consumed by normal children compared to children autism sufferers. In both, the child's blood analyzed the contents of cytokine-cytokine content, turns out it's in the blood of autistic sufferer increases much higher than a normal child. Increased cytokine that can become a cause of genetically later will cause the onset of autism. (Sarwindah, 2002).

In addition, age factor of the father has influence for childhood autism. According to an article in the Associated Press (2006), the man who became a father at 40 years old or more has a higher risk to have autistic children. A research in Israel shows that children were born from older father to have bigger possibility that children were born from the younger father.

2.7 How to recognize the symptoms of autism in children

There is no tool for diagnosing the autism for the infant so far. Experts are doing screening test from the baby at 4 months old. At that age, the parent is advised for observing their children for some symptom as following:

- Reaction to light colors and can follow a moving object
- Turned toward the source voice.
- Reaction when looking at a person's face.
- Smile when we give smile to him.

At 12 months old, babies need to be wary of the possibility of autistic symptoms such as:

- No eye contact.
- Could not point to a particular object.
- Cannot give stuff to people.
- Do not understand when their name is called.
- Cannot communicate babble (say "pa", "ma ma", "da da").

A consultation with a pediatrician is needed when the symptoms above exist, perhaps those disorders are the early symptoms of autism. (Gamayanti, 2006)

3. METHODOLOGY

3.1. Research design

Design research is the stage that will be done by researchers to conduct the research. The research design of the application for autism symptoms test based on Android are following:

The following stages of research conducted:

1. Determine the data needs to be used.
2. Preparing tools and materials research. Tools are hardware and software while the research materials are data that has been collected.
3. Interview with experts.
4. System development by Forward Chaining method
5. The result of the system operation is the diagnosis of early autism symptoms.

The steps taken in this research are:

- 1) Literature review: This stage is conducted by collecting the information that used as a reference for application design of autism symptom tests and Forward Chaining method.
- 2) Interviews: This step is collecting data by questioning and getting the answer directly in the research place. The place is Galuh Handayani School Surabaya.

3.2. Decision tree

Forward chaining or data-driven (data-driven) forward tracking. In this tracing the tracking starts from the input information and then tries to illustrate the forward tracking conclusion looking for facts that match the IF section of the IF-THEN rules.

The rules of a decision tree for early detection autistic symptoms are following:

R1: IF G001 AND G002 AND G003 AND G005 AND G006 AND G007 AND G009 AND G012 AND G015 AND G018 AND G021 AND G024 AND G027 AND G030 AND G033 AND G036 AND G042 THEN A001 (Autism Infantile)

R2: IF G002 AND G005 AND G010 AND G013 AND G016 AND G019 AND G022 AND G025 AND G028 AND G031 AND G034 AND G037 AND G039 AND G040 AND G041 AND G043 AND G046 THEN A002 (Syndrome Asperger)

R3: IF G002 AND G004 AND G005 AND G008 AND G011 AND G014 AND G017 AND G020 AND G023 AND G026 AND G029 AND G032 AND G032 AND G035 AND G038 AND G044 AND G045 AND G047 THEN A003 (Attention Deficit Hyperactive Disorder / ADHD)

Table 1 Name of Symptoms of Autism

Symptom code	Symptom name
G001	The development of speech is late, or does not develop
G002	Lack of reciprocal communication
G003	Rarely complete the command until complete
G004	Luggage is often left behind like a toy
G005	Avoid eye contact while communicating or not maintaining eye contact
G006	Unusual language that is repeated or stereotyped
G007	Abnormal facial expression
G008	Often make mistakes
G009	Can not feel what others feel
G010	Uncoordinated motor movements that include strange posture, rigid gait, or awkward movements
G011	Easily switch attention (mainly by voice stimulation)
G012	How to play less varied, less imaginative and less able to imitate
G013	Doing something over and afraid of change
G014	Talk too much
G015	Maintain one or more requests, in a typical and exaggerated manner
G016	Eccentric personality
G018	Can not be quiet / silent
G019	Glued to a ritualistic activity or a useless routine
G020	Be nonchalant
G021	Often rowdy moods
G022	Performed a peculiar movement
G023	Not so expressive in tone of speech

G024	Always hold what's seen
G025	Often very fascinated by objects
G026	Talking style tends to be formal, takes things literally, and is unable to recognize metaphors or satire
G027	More restless and impulsive than those of the same age
G028	The development is rather late for example in walking
G029	Busy with yourself, thinking inflexible, and lacking imagination
G030	Likes to shout
G031	Refused to be hugged
G032	Feeling very difficult to understand emotions
G033	Often take friends toys by force
G034	Liked to suddenly cry or laugh without cause
G035	Can not understand the facial expressions of others
G036	Impatient
G037	Play with objects that are not toys
G038	Never ask anything by pointing a finger
G039	hard to sleep
G040	Like experiencing hearing loss
G041	Never carry and show something to others
G042	There is no appetite
G043	Likes to hurt yourself by biting or scratching
G044	Does not respond when called his name
G045	Stubborn
G046	Sembrono dan menjengkelkan
G047	Tidak peduli dengan orang lain didekatnya
G048	Sulit memfokuskan perhatian

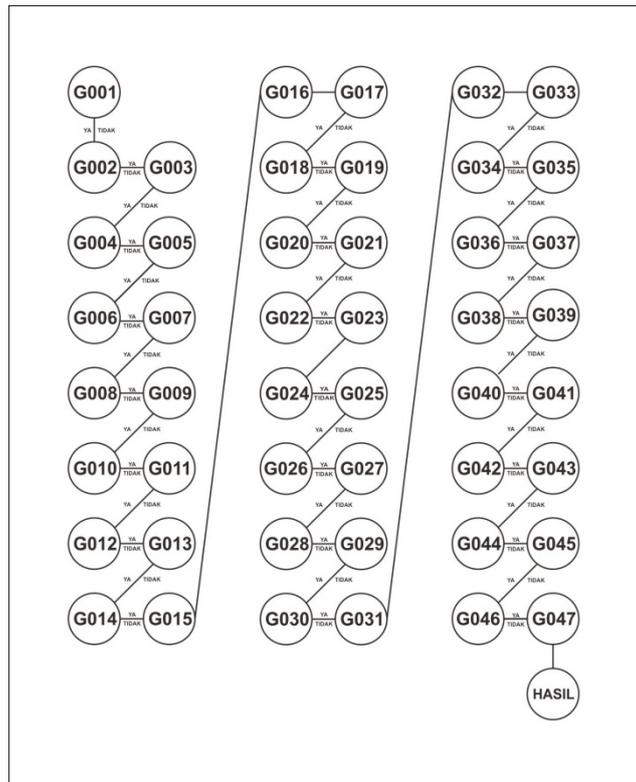


Figure 1 Decision tree

4. IMPLEMENTATION

4.1. Application

There are menus such as Detection buttons, About, Start and Exit. Each button has its own function

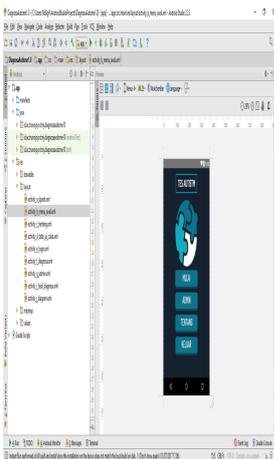


Figure 2 Main Menu

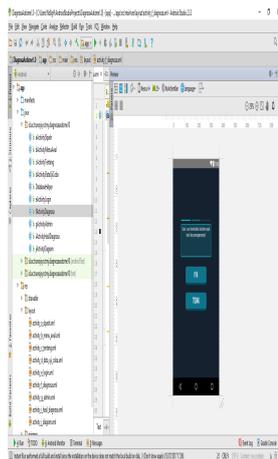


Figure 3 Questions

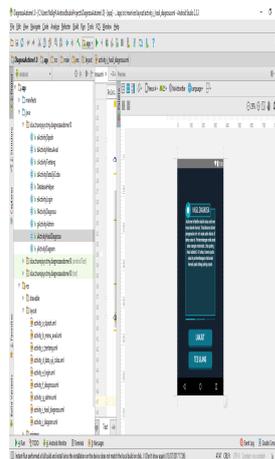


Figure 4 Diagnostic Results

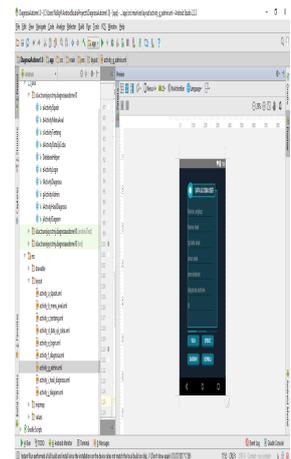


Figure 5 Test data

Figure 2 main menu there is a menu in which there are Detection buttons, About, Start and Exit each has its own function. Figure 3 questions about autism symptoms that will be answered by the user by choosing answers that have been provided in each case. Figure 4 diagnostic result that have answered the diagnostic questions that have been provided, then the results will be in the show. Figure 5 Test Data Existing Table untk administrator edit data already tested. And in this view there are View, Update, Diagram, and Back buttons. Figure 6 diagram piey is the result of Autism Infantile, Spenger's Syndrome and ADHD can be seen in this application for the average test result in a child

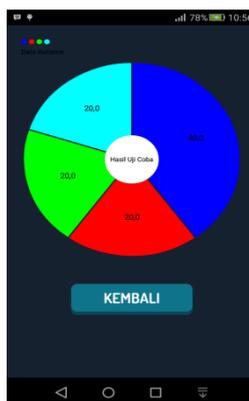


Figure 6 Pie Diagram

5. Conclusions

1. This application could be useful for parents or teachers to know early about symptoms of autism in children and know the types of autism symptoms so that it can cope with the solutions.
2. The existence of Android-based application makes it easier for parents or teachers to take time to detect symptoms of autism in children from an early age.
3. Applications using Forward Chaining Methods to detect autism symptoms start from the beginning.

References

- [1] Gusti Ayu Kadek Tutik A, Rosma Delima and Umi Probeykti 2009, '*Implementation of Forward Chaining in Diagnosis of Autism Children*' Program, Journal of Informatics Vol.5, No.2.
- [2] Rini hildayani, dkk 2010, *Handling of Children with Disabilities (Children with special needs)*, Open University, Jakarta
- [3] Riskadewi and Antonius Hendrik 2005, '*Implementation of Rules Forward Chaining Expert System on Flight Status Control*', Integral Vol 10, No3.
- [4] Arhami, M. 2005. *Basic Concepts of Expert Systems*. Andi, Yogyakarta
- [5] Gusti Ayu Kadek Tutik A, Rosma Delima and Umi Probeykti 2009, '*Implementation of Forward Chaining on Diagnosis Program for Autistic Patients*' Children Journal of Informatics Vol.5, No.2.
- [6] Rakheena and Yulian Findawati, S.T, M.MT 2015, *Home Expert System Program For Autistic Children Using Web-Based Forward Chaining Method*, Informatics Engineering Department Muhammadiyah University of Sidoarjo
- [7] World Psychology. 2011. *Autism, Understanding and Defenisisnya. Article*, September 2011
- [8] Marlina. 2009. *Assessment In Children with Special Needs*. Padang: UNP Press.
- [9] Gunawan, Adi. 2011. *Hypnotherapy - The Art Of Subconscious Restructuring (Hypnotherapy - The Art of Structuring the Subconscious Mind)*. Jakarta: Gramedia.

- [10] Ika Widyawati, Dr. 2000. *Autistic Child Therapy At Home*. Jakarta: Puspa Swara.
- [11] Kusumadewi, S. 2003. *Artificial Intelligence (Engineering and Its Application)*. Yogyakarta: Graha Ilmu.
- [12] Sutarman. 2007. *Building Web Applications with PHP and MySQL*. Yogyakarta: Graha Ilmu.
- [13] Turban, E. 1995. *Decision Support and Expert System; Management Support System*. Newyork: Prentice-Hall.