

# Introduction

What is research ? Why and how to do a research ?

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**Name** Anto Satriyo Nugroho  
**Birthday** October 1970  
**Education** received B.Eng(S1), M.Eng (S2) and Dr.Eng (S3) from Nagoya Institute of Technology, Japan (Electrical & Computer Eng.) in 1995, 2000 dan 2003.  
Scholarship from Pemerintah RI (S1) & Japanese government Monbukagakusho (S2 & S3)

### **Core competence**

- Pattern Recognition, Artificial Intelligence & Datamining
- Biomedical Engineering & Bioinformatics/Computational Biology
- Research overview & publication can be seen from  
<http://asnugroho.net/publist.html>

### **Work experiences**

- 1990-now BPP Teknologi (Pusat Teknologi Informasi & Komunikasi)
- 2003-2004 Visiting Professor at School of Computer & Cognitive Sciences, Chukyo University, Japan
- 2004-2007 Visiting Professor at School of Life System Science & Technology, Chukyo University, Japan
- 2003-2007 Researcher at Institute for Advanced Studies of Artificial Intelligence, Chukyo University Japan
- 2007-now Vice president of Indonesian Society for Softcomputing
- 2007-now Lecturer at Swiss German University, Al Azhar Univ. Indonesia

# References

- Pocket book of Technical writing for Engineers and Scientists” by Finkelstein, McGraw-Hill ISBN 9780071259255
- The Scientific Attitude, 2nd Edition, Grinnell, F., Guilford Press, New York, NY. 1992
- On Being A Scientist: Responsible Conduct In Research, National Academy of Sciences, National Academy of Eng. Institute of Medicine, National Academy Press, Washington, D.C.1995 (available at <http://www.nap.edu/html/obas/> )
- Scientists must write (2nd edition), Robert Barrass, Taylor & Francis, 2002
- Writing for Computer Science, Justin Zobel, Springer, 2nd Ed., April 2004

## What will you learn from this subject ?

- Difference between research and lecture
- why research is important to become an engineer
- How to do a research in computer science
- Technical writing
- Basic skill of research presentation
- How to communicate the result research to scientific community
- Thesis preparation
- Thesis proposal

# Lecture plan

- What is research ? Why and how to do a research ?
- Find a good research problem
- Literature reviews
- Writing the research proposals
- Progress report & research report
- Writing the abstract & summaries
- Electronic publishing
- Research presentation
- Seminar on ICT (4)
- Research proposal presentation (2)

# Research theme evaluation

- **Originality**  
your work is new, novel, nobody in the world has done your research
- **Practicality**  
Manuscripts shall be evaluated as effective when their contents are interesting to readers and their achievements contribute in some way to developing science and technology.
- **Reliability**

[http://www.ieice.org/eng/shiori/page2\\_iss.html#1-1](http://www.ieice.org/eng/shiori/page2_iss.html#1-1)

# Evaluation criteria for research publication in SPIE journals

## Journalistic criteria

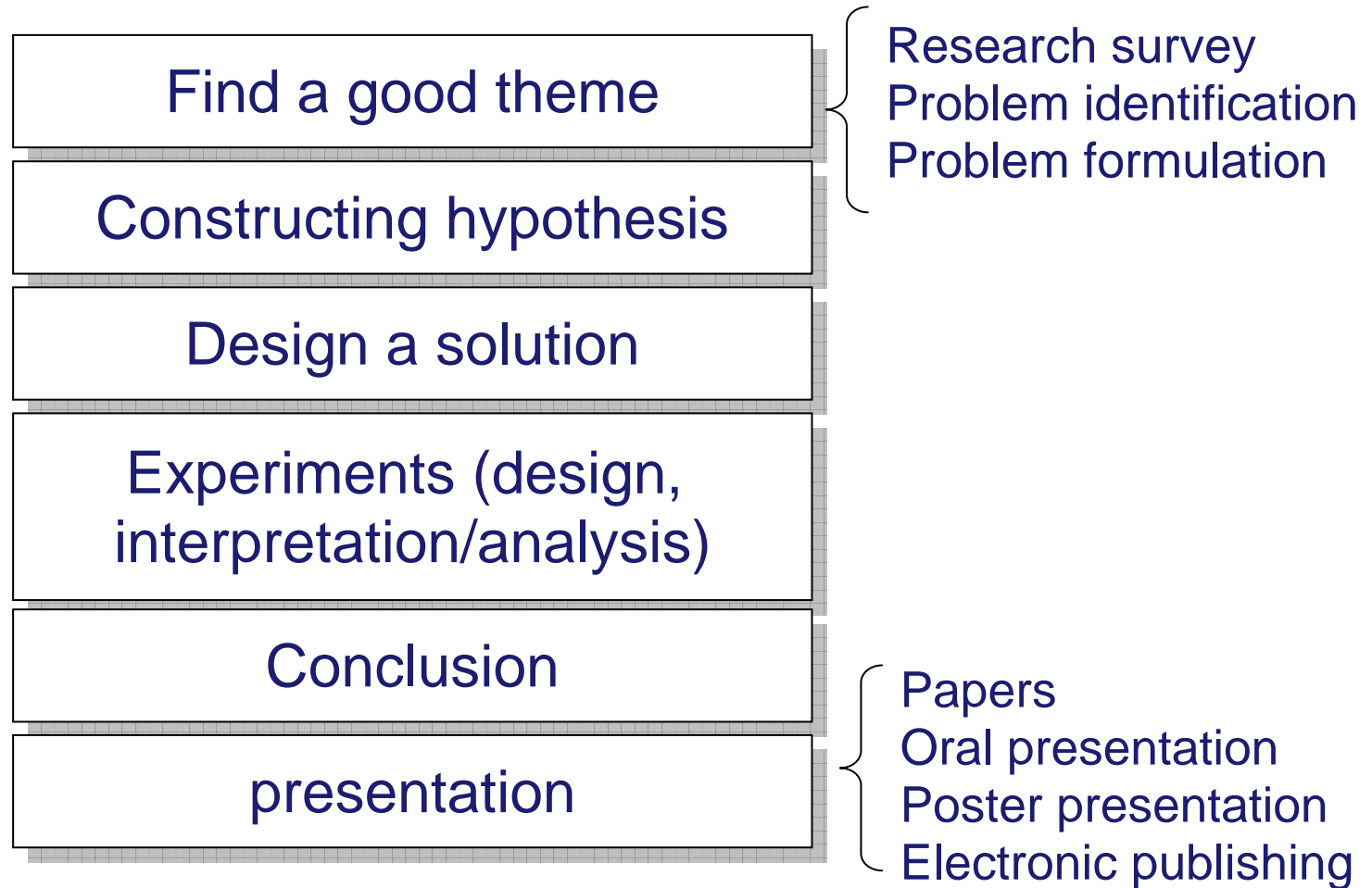
1. Appropriatenes for this journal
2. Interest to audience
3. Quality of writing (English language)
4. Organization
5. Length relative to substance
6. References to literature

## Scientific merit

1. Novelty of results
2. Significance of results (Contribution to field)
3. Technical accuracy of results
4. Rigor (mathematical or experimental, whichever applies)
5. Experimental results
6. Substantiation of conclusions

SPIE : The International Society for Optical Engineering  
 (formerly: Society of Photographic Instrumentation Engineers  
<http://spie.org/>)

# Research process



# Criteria of a choosing a good research theme

- Novel, original
- Interesting
- Significant contribution
- Difficult, but ...
- Solvable within the given period (usually : 1 year for most universities)
- Open a new problem for further exploration in the future

# **Illustration:**

## **Doing research in Japanese university**

# Members of a laboratory

Professor (1)

Associate Professor (1)

Assistant Professor (1)

Research Associate ( $2 \leq$ )

Post Doctoral Students (if any)

PhD students

Master students

Bachelor Students

## Semester 6

- Presentation of each laboratory (research topics, education system, etc)
- Students choose the laboratory
- Selection based on :
  - GPA
  - Short paper showing the research interest of the students
  - interview
- A good laboratory
  - Good research topics (publication)
  - Connection with companies, research institutions, etc

## Activities (Semester 7 & 8)

- April: Welcome party, “hanami”, students start to find company with the recommendation of university/professor
- Weekly seminar
  - Research progress evaluation
  - Selecting research theme for the students
  - Book/journal reading
  - Unix seminar, programming seminar
- Sports, games (softball, marathon, hiking “yamanobori”, barbeque, “konpa”)

## Activities (Semester 7 & 8)

- July, August : "zemi ryoko" (picnic), "natsu kadai" (homework)
- July/August : Master program entrance examination
- December : Mid Term Evaluation
- Ski, "bounenkai" (end year party)
- February : Final Evaluation
- Farewell party

## Activities (Semester 7 & 8)

- Students should come to the laboratory everyday, and conducting research under supervision of the professors
- “seven eleven”. Seminar sometimes started from 7 pm and finished in the next day (^^;
- A laboratory = small company
- Research is not only for graduation. It is part of laboratory contribution to the science.
- Some laboratories do not allow the students to have part time job (“arubaito”), but others do

# Research in laboratory

Long term objective (e.g. AI)

Short term objectives

neuron modelling

modeling of auditory  
information system

Character recognition

ECG compression

Game theory

Neuro-fuzzy

# Research in Japanese laboratory

- Professor has a big “problem” (big theme)
- Students helps the professor to solve each problem based on their “level” under tight supervision of the professor
- Team work : the work of the students is part of a big “story”

# Thesis presentation

- Bachelor : 7 minutes presentation + 2 minutes discussion

## Examples of research themes

- Character recognition
- Computer vision
- Meteorological prediction
- Computer Aided Diagnosis
- Datamining

# Assignment (1)

Find an interesting research topic and make a brief summary (A4, 1 page), and send by email

To: asnugroho@gmail.com

Subject : RM-A-01

Deadline: 17 September 2008

You may find the topic from former SGU thesis, consultation with lecturers, internet, etc.