

ABU NASER MD. ZAINUDDIN

LECTURER

Department of EEE

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OBJECTIVE

To make a significant contribution towards the incessant advancements of modern science and technology.

Bangladesh University of Engineering & Technology (BUET), Dhaka

- ❑ M.Sc in Electrical & Electronic Engineering (February, 2006)
- ❑ CGPA: 4.00 / 4.00; (90% and above in all subjects)
- ❑ B.Sc in Electrical & Electronic Engineering (February, 2004).
- ❑ CGPA: 3.90/4.00; Ranked 4th among 139 students in the department.

ACADEMIC CARRIERS

Dhaka College, Dhaka

- ❑ Higher Secondary Certificate (HSC) (A level equivalent) (September 1997).
- ❑ Marks Obtained: 90.7%.
- ❑ Stood 15th in the Dhaka Board combined merit list.

Govt. Laboratory High School, Dhaka

- ❑ Secondary School Certificate (SSC) (O level equivalent) (August 1995).
- ❑ Marks Obtained: 89%.
- ❑ Stood 8th in the Dhaka Board combined merit list.

HONORS & SCHOLARSHIPS

- ❑ Position in the University Deans List (placed 4th).
- ❑ University Merit Scholarship.
- ❑ Awarded by Dhaka College Authority for HSC result (1997)
- ❑ Awarded by the Prime Minister of Bangladesh for SSC result (1995)
- ❑ Awarded by the *Dhaka Youth Foundation* for SSC result (1995)
- ❑ Dhaka Board Scholarships (1997,1995)

SOLID-STATE ELECTRONICS

RESEARCH INTEREST

- ❑ Semiclassical and Quantum mechanical modeling of nanoscale MOS Devices including Strained MOS, DG MOS and SOI MOS.
- ❑ Nanowire and Nanotube transistor physics.
- ❑ Strained QWire and QWell Lasers.

RELEVANT COURSE WORKS

UNDERGRADUATE LEVEL:

- ❑ PHY 109:Structure of Matter
- ❑ EEE 213:Electronic Circuits
- ❑ EEE 303: Electromagnetic Fields & Waves
- ❑ EEE 307:Electrical Engineering Materials
- ❑ EEE 311: Optoelectronics
- ❑ EEE 413:Semiconductor Devices
- ❑ EEE 421:VLSI Circuits

MASTER'S LEVEL:

- ❑ EEE 6401:MOS Devices
- ❑ EEE 6404: VLSI technology & device modeling
- ❑ EEE 6405:VLSI design
- ❑ EEE 6504:Semiconductor Materials & hetero-structures

RESEARCH WORKS

SOLID-STATE DEVICE

M.Sc Dissertation:

- A. N. M. Zainuddin and A. Haque, “*Modeling Electrostatic Properties of Strained-Si on SiGe MOS Devices*”, December 2005 (expected), M.Sc Engg. Thesis, Department of EEE, BUET, Dhaka, Bangladesh.
- **Objective:** The objective of this work is to estimate the threshold voltage, gate capacitance and direct tunneling properties of strained-Si-SiGe n- and p-MOS devices using an accurate, physically based, both semiclassical and quantum-mechanical models.

DIGITAL SIGNAL PROCESSING

B.Sc Dissertation:

- A. N. M. Zainuddin, N. Sultana, Md. Ahsanullah, M. R. Rezwan Khan, “*Estimation of Vocal Fold Transfer Function from the Spectral Response of Speech Signal in Speaker Modeling*”, February 2004, B.Sc Engg. Thesis, Department of EEE, BUET, Dhaka, Bangladesh.
- **Objective:** The objective of this work was to identify some constant parameters of our vocal fold during the utterance of different voiced sounds and pitch levels through spectral envelope estimation method.

POWER ELECTRONICS & DIGITAL CONTROL

Projects:

- **Microcontroller based Pre-paid energy meter: (August 2002)**
 - I worked under Dr. Prof. Lutful Kabir Sir to familiarize myself with the microcontroller based control systems.
 - There I designed a microcontroller based detection system that is a way to prevent the Prepaid-energy meter being bypassed illegally and thereby restrain bill forgery.
- **Clamp-on ammeter:**
 - I, with some of my classmates, designed a simple clamp-on ammeter, based on the principle of ‘Biot-Sabart’ law of electro-magnetic induction. The meter could successfully measure the current through a line without interrupting the circuit.

JOURNAL:

- A. N. M. Zainuddin and A. Haque, “*Threshold voltage reduction in Strained-Si-SiGe MOS devices due to a difference in the dielectric constants of Si and Ge*”, IEEE Trans. Electron Devices, vol. 52, no. 12, Dec 2005.
- **Abstract:** We showed that higher value of the dielectric constant in SiGe relative to that in Si causes a reduction in the magnitude of the threshold voltage in strained-Si-SiGe n- and p-MOSFETs. This reduction increases with decreasing thickness of the strained-Si layer. Our results are consistent with the observed mismatch between calculated and measured threshold voltage shifts in strained-Si MOSFETs.

PUBLICATIONS

CONFERENCE:

- **A. N. M. Zainuddin** and A. Haque, “*A new analytical expression for the Si surface potential in strained-Si-SiGe MOSFETs*”, Proceedings of International Conference on Electronic and Photonic Materials, Devices and Systems, EPMDs-2006, Kolkata, INDIA, January 4-6, no. 41, pp. C7-C9, 2006.
- **Abstract:** A new analytical expression for Si surface potential in deep submicron strained-Si-SiGe MOS devices have been derived based on semiclassical analysis. The semiconductor surface potential depends on bandgaps and dielectric constants of both strained-Si (SS) cap material and relaxed Si_{1-x}Ge_x layer. It is shown that the surface potential decreases with increasing Ge-mole fraction, decreasing strained-Si thickness and decreasing doping densities. These reductions are enhanced if different value of dielectric constant of SiGe layer is considered

- **A.N.M. Zainuddin**, N. Sultana, Md. Ahsanullah and M. R. Khan, “*Estimation of vocal system invariant poles using frequency domain envelope function*”, Proceedings of 3rd International conference on Electrical and Computer Engineering, ICECE 2004, Dhaka, Bangladesh, pp. 112-115.
- **Abstract:** The paper presents a novel approach to classify certain vocal system properties that are consistent for a particular person irrespective of the pitch or utterances. To reduce the influence of the cavities in the vocal system, envelop of the Fourier coefficients of the recorded speech are taken to estimate the system poles. It is observed that a pair of poles remains reasonably consistent irrespective of the pitch or the sound. Such a pair of poles associated with the glottal response of the vocal fold, can be an identifiable characteristic of the person under consideration.

PROSPECTIVE WORKS :

- On the capacitance-voltage characteristics of strained-Si-SiGe pMOS devices.
- On the gate current-voltage characteristics of strained-Si-SiGe pMOS devices

CURRENT ACTIVITIES:

- Co-Supervising an undergraduate final year student group - On the compact model for MOS device under **high-k** gate dielectric.
- Studying on Strained Nanowire MOS devices.

WORK EXPERIENCE

April 2004 – present

Lecturer in the Department of EEE, BUET, Dhaka-1000, Bangladesh

- Used IBM PC & compatible machines in Windows and Dos environments
- Have knowledge in Hardware Assembling and Trouble-shooting

COMPUTER SKILLS

Language: MATLAB, C/C++, Assembly, VHDL.

Simulation Tools: Orcad

EXTRA CURRICULAR

- I am a player of our faculty Cricket team from my undergrad period and played a number of matches both in and outside of the university. Also fond of football and table tennis.

ACTIVITIES

□ I am fond of *Nazrul Giti*, a classical music style of our country. I took lessons from 'Nazrul Academy' (1991-94) and took part in many cultural programs.

- Certificate of Teachers' Appreciation (February, 2005)
- Certificate of BSc in Electrical and Electronic Engg. (February, 2004)
- Certificate of Membership in the Faculty Cricket Team (September, 2003)

CERTIFICATES EARNED

- Certificate of Industrial Training (December, 2003)
- Certificate of attending a course on **Visual C/C++** programming language (March, 2003)
- Higher Secondary Certificate (HSC) (September, 1997)
- Secondary School Certificate (SSC) (August, 1995)
- Certificate of Merit from the **Prime Minister** of the Republic of Bangladesh (1995, in Bengali)

Motivation

I am highly motivated to do research works on subjects through which I can develop my skills. While working on a particular topic, I always look for things that are still unnoticed by many even though significant. I am critical by nature during an investigation.

Responsibility

I am very much prompt in finishing the tasks at hand and providing interesting and thoughtful feedbacks to my supervisor.

Leadership capability

I usually played the protagonist role in taking necessary initiatives and making plans whenever I worked in a group. My interpersonal communication skills always helped me to organize the individual thoughts such as to facilitate the problem-solving process. So I am comfortable to work both individually and in a group.

OVERALL PERSONAL STRENGTH

1. Dr. Anisul Haque (<http://203.208.166.84/anhaque/>)

Professor, Department of EEE, East West University, Dhaka, Bangladesh.

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2. Dr. Md. Rezwan Khan

(<http://www.uiu.ac.bd/faculty/Web/rezwan/MRezwan.html>)

Vice Chancellor, United International University (UIU), Dhaka-1209, Bangladesh

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3. Dr. Md. Ali Choudhury

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REFERENCES