

# Sifat Muhammad Abdullah

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## EDUCATION

Virginia Tech, Ph.D. in Computer Science, advisor: Dr. Bimal Viswanath	Jan 2021 - Present
BUET, B.S. in Computer Science and Engineering (GPA: 3.91/4.0)	2015 - 2019

## RESEARCH INTERESTS

Security, Adversarial Robustness of Generative AI Defense strategies, Improving Defenses with better Content Semantics understanding using Multimodal Foundation models, toxicity mitigation in Large Language Models

## SELECTED PUBLICATIONS

[IEEE S&P'24] 1st author. "An Analysis of Recent Advances in Deepfake Image Detection in an Evolving Threat Landscape".

[ACSAC'23] 2nd author. "A First Look at Toxicity Injection Attacks on Open-domain Chatbots".

[IEEE S&P'23] 2nd author. "Deepfake Text Detection: Limitations and Opportunities". Dataset requested by 143 research groups.

## SELECTED PROJECTS

### Deepfake Image Detection | Published in IEEE S&P'24

- Studied 8 state-of-the-art deepfake image detectors using Diffusion and GAN-based text-to-image generators
- Developed adversarial attacks using LoRA and Vision Foundation models without adding adversarial noise
- Used metrics for measuring attack success, along with underlying semantic meaning and quality of images
- Achieved more than 70% recall score degradation against most of the deepfake image detectors

### Toxicity Injection Attacks | Published in ACSAC'23

- Studied toxicity injection attacks on chatbots after deployment in a Dialog-based Learning setup
- Evaluated BART and BlenderBot LLM chatbots
- Proposed fully automated indiscriminate and backdoor attacks using public LLMs with high attack success

### Deepfake Text Detection | Published in IEEE S&P'23

- Collected and released real-world deepfake text dataset, including T5 and GPT-3 powered bots' data
- Evaluated state-of-the-art deepfake text detectors, e.g., BERT and GPT-2 based defenses
- Developed fully black-box and low-cost adversarial attack without access to defender or surrogate model
- Our adversarial attack achieves high evasion rate while maintaining linguistic quality of text

## EXPERIENCE

Virginia Tech SecML Lab – Graduate Research Assistant	Jan 2022 - Present
Virginia Tech – Graduate Teaching Assistant	Jan 2021 - Dec 2021
BUET DataLab – Graduate Research Assistant	Jan 2020 - Dec 2020
REVE Systems – Software Engineer	May 2019 - Dec 2019

## ACHIEVEMENTS

- **Invited Talk:** VT Skillshop Series: Leveraging Creative Technologies (Oct 2023)
- CCI SWVA Cyber Innovation Scholarship: 2024-2025
- CCI Research Showcase: 2024
- *The Dark Side of AI* - VPM News Focal Point: 2023
- *The Rise of the Chatbots* - Communications of the ACM: 2023
- *The strengths and limitations of approaches to detect deepfake text* - TechXplore: 2022

## TECHNICAL SKILLS

- |                           |   |
|---------------------------|---|
| • <b>Languages:</b>       | Python, C/C++, Bash, Java, JavaScript, Assembly                     |
| • <b>Frameworks:</b>      | PyTorch, TensorFlow, Keras, Django                                  |
| • <b>Libraries:</b>       | Scikit-learn, NumPy, pandas, Matplotlib                             |
| • <b>Developer Tools:</b> | Git, Vim, Jupyter Notebook, VS Code, Markdown, LaTeX, Linux, Docker |