

Three pages any three research topics

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Introduction:

Hi! My name is **Awais Ali**. I'm 23 and I live in **Pakistan**. I'm interested in computer science, music, sport and fantasy literature. Computers first appeared in my life when I was sixteen.

At first, I was just playing computer games, but some time later, I noticed that I could do a lot more things with the computer, for example programming. Now, I can programme in Pascal, C++ and HTML. I have done many programmes. I hope that in the future I will get a job as a computer scientist

I have done BSCS. With a BS degree in Computer Science, I have a full understanding of the full lifecycle of a software development project. I also have experience in learning and excelling at new technologies as needed.

My dream is to further study in computer science and to go to Australia. I love everything associated with this country. And I hope that in the future, I want to get a job there as a computer scientist. .

You can be reached me anytime via email at **Awais.shah00@yahoo.com** or my cell phone, **92-301-7232655**.

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Computer Networking:

The computer network technology is developing rapidly, and the development of internet technology is more quickly, people more aware of the importance of the network security. Network security is main issue of computing because many types of attacks are increasing day by day.

(Awais Ali)

Network Security

With the Internet becoming central in daily communication, network security issues become very critical. Various communication paradigms have been deployed, each requiring specific security protection. In particular, as the Internet becomes a centerpiece of our daily lives, pirates are developing attack mechanisms using communication resources instead of traditional approaches.

We analyze the Internet traffic to gain more insight on attacks such as spam and worms. This understanding will guide the design of better communication mechanisms and protocols to prevent such attacks. In addition, we try to identify security flaws of emerging network technologies and develop attack prevention mechanisms to thwart malicious behavior.

Private Communication and Execution

One central concern in today's computing world is the privacy and integrity of sensitive data processed at remote systems. In this project, we propose a blind processing service using trusted computing mechanisms to provide improved privacy and integrity to its users.

Utilizing blind communication and execution services, a user can exchange sensitive information with a remote system via isolated processes whose execution environment and data is shielded from the rest of the system after ensuring the system has correct hardware, trusted computing base, correct credentials, and trustworthy state. Our goal is to allow information exchange between system components with protection mechanisms against everyone including system administrators.

Cyber Forensics

As criminals utilize advanced technologies, law enforcement will be at a disadvantage in staying well informed of the complex technical issues that accompany investigating and prosecuting high technology crimes. In this project, we investigated mechanisms track cyber criminals when they use anonymizer technologies. We determined potential exploitation of criminal systems and developed a tool suite that can automate the exploration process.

In this direction, we investigated:

- Local/global monitoring systems for major anonymizer networks
- Multiplication attack to correlate entry and exit nodes in anonymizer networks
- Data mining tools to correlate user behaviors so that flows can be classified
- Circuit Clogging techniques to insert busy cycles that can identify flows
- Watermarking techniques to identify users

In particular, we investigated how browsers can be used to correlate criminal activities of users, how application-level protocols such as bit-torrent can leak identifying information, and how document scripts can report identifying information.

Reference:

<https://www.unr.edu/cse/research/cybersecurity-and-network-systems/network-projects>

Image processing techniques

Digital image processing is always an interesting field as it gives improved pictorial information for human interpretation and processing of image data for storage, transmission, and representation for machine perception. Image Processing is a technique to enhance raw images received from cameras/sensors placed on satellites, space probes and aircrafts or pictures taken in normal day-to-day life for various applications. This field of image processing significantly improved in recent times and extended to various fields of science and technology. The image processing mainly deals with image acquisition, Image enhancement, image segmentation, feature extraction, image classification etc. **(Awais Ali)**

The various image enhancements and image processing techniques will be introduced in this section. Computer software programs are available, including some or all of the following programs:

Enhancement programs make information more visible.

- Histogram equalization-Redistributes the intensities of the image of the entire range of possible intensities (usually 256 gray-scale levels).
- Unsharp masking-Subtracts smoothed image from the original image to emphasize intensity changes.

Convolution programs are 3-by-3 masks operating on pixel neighborhoods.

- Highpass filter-Emphasizes regions with rapid intensity changes.
- Lowpass filter-Smooths images, blurs regions with rapid changes.

Math processes programs perform a variety of functions.

- Add images-Adds two images together, pixel-by-pixel.
- Subtract images-Subtracts second image from first image, pixel by pixel.
- Exponential or logarithm-Raises e to power of pixel intensity or takes log of pixel intensity. Nonlinearly accentuates or diminishes intensity variation over the image.
- Scaler add, subtract, multiply, or divide-Applies the same constant values as specified by the user to all pixels, one at a time. Scales pixel intensities uniformly or non-uniformly
- Dilation-Morphological operation expanding bright regions of image.
- Erosion-Morphological operation shrinking bright regions of image.

Trend removal programs remove intensity trends varying slowly over the image.

- Row-column fit-Fits image intensity along a row or column by a polynomial and subtract fit from data. Chooses row or column according to direction that has the least abrupt changes.

Edge detection programs sharpen intensity-transition regions.

- First difference-Subtracts intensities of adjacent pixels. Emphasizes noise as well as desired changes.
- Morphological edge detection-Finds the difference between dilated (expanded) and eroded (shrunken) version of image.

Image analysis programs extract information from an image.

- Gray-scale mapping-Alters mapping of intensity of pixels in file to intensity displayed on a computer screen.
- Slice-Plots intensity versus position for horizontal, vertical, or arbitrary direction. Lists intensity versus pixel location from any point along the slice.
- Image extraction-Extracts a portion or all of an image and creates a new image with the selected area.

Reference: (<https://www.nde-ed.org/EducationResources/CommunityCollege/Radiography/AdvancedTechniques/Real Time Radiography/ImageProcessingTechniques.ht>)

Improve your social life with computer

The growing popularity of social networks over the past five years has had a significant impact on personal and professional relationships and many survey participants referred to Facebook and social networks in general in their answers. The other most-often-mentioned digital networked communications methods included in the survey-takers answers were email, voice over IP (Skype is one example that was used), and text-messaging. **(Awais Ali)**

Why is computer science important?

It might seem like a simple question, but there's a lot that goes into answering it. You might start by focusing on the benefits it could bring you personally. You might talk about how computer science-related jobs are appealing in their versatility, earning potential and demand. You might hear about all of the things we use on a daily basis today that were only created because of computer science.

If you're looking to leverage your love of technology to make a difference, then rest assured. Computer science is an incredible career choice for someone who wants to change the world.

"Societies will die if they don't continue to innovate," says Werner Krebs, CEO of Acculation. Krebs says technologies are neither good nor evil on their own, but, in the right hands, can become powerful benefits to society. "We need bright and ethical people to understand our best and most powerful technologies to ensure they are used for good."

Computer science benefits society by ...

1. Directly meeting needs
2. Empowering people who are often overlooked
3. Paving the way for a more equitable world
4. Accelerating healthcare progress
5. Furthering education
6. Expanding communication
7. Predicting and avoiding catastrophes
8. Positively impacting every area of society

How will you make a difference?

There's no denying it—the reach of computer science is extensive. And we're only just scratching the surface with what good can come from it!

Now that you know the many ways computer science benefits our society, you might be wondering about the roles in which you'd put a Computer Science education to use.

Reference:

<https://www.rasmussen.edu/degrees/technology/blog/ways-computer-science-benefits-society>

