

**NELSON MANDELA**  
UNIVERSITY



**Information Security Research:  
A 35-year journey  
Rossouw von Solms**

# IFIP, TC11, Kristian Beckman & me

## ■ Who is Rossouw von Solms

- About 40+ years in academia
- 35+ Years in computer, information & cybersecurity
- Supervised numerous master's and PHD students
- 250+ Peer-reviewed publications

# IFIP, TC11, Kristian Beckman & me

## ■ Rossouw von Solms and IFIP

- Attended first IFIP/Sec in 1991 in Brighton, UK
- Attended many since and served in TC11 and GA
- My route through IFIP
  - Started as a PhD student in 1991
  - Served on TC11 till 2024
  - Part of Organising Committee of IFIP/Sec 1995 & 2007
  - Served on GA from 2014 to 2020
  - Made MANY academic friends all over the world

# IFIP, TC11, Kristian Beckman & me

## ■ Rossouw von Solms and Kristian Beckman

- Since attending IFIP/Sec in 1991
- I met many world famous academics at IFIP/Sec
- All were very helpful and supportive
- Spoke to and liaised with many KB recipients; e.g. Harold Highland, Willian Caelli, Willie List, Pierangela Samarati, Basie von Solms, Louise Yngstrom, Gene Spafford, etc.
- IFIP Fellow in 2024 and KB recipient in 2026
- IFIP enabled, empowered and acknowledged

# Security research from 1991 - 2026

## ■ This presentation is:

- NOT some cutting edge research presentation
- A talk to young academics and students
- Based on my 35+ years in security research
  - How the focus changed, expanded and developed
  - How an academic and researcher has to adapt continuously
- Try and learn something from this to shape your future

# Security research from 1991 - 2026

## ■ IFIP/Sec 1991

- $\pm 30$  peer-reviewed papers
- Security priorities of early 1990s
  - Trusted operating systems
  - Access control models
  - Cryptography
  - Database security
  - Security management and policies – very low, technical level
- Very much Computer Security

# Security research from 1991 - 2026

- Security conferences in 1991
  - $\pm 10$ -12 conferences globally
  - Computer security and systems security
  - Research presentations very formal and mathematical oriented
- Security conferences in 2026
  - $\pm 300$ -500 conferences globally
- How did this explosion take place?

# Security research from 1991 - 2026

- Security advancement over the decades:
  - 1991+
    - Protect individual computer systems
    - Mainframes, early LANs, etc.
  - 2001+
    - Secure the Internet
    - Web, e-commerce, PKI, etc.

# Security research from 1991 - 2026

- Security advancement over the decades:
- 2010+
  - Protect global digital infrastructure
  - Cloud, mobile, etc.
- 2020+
  - Secure complex cyber ecosystems
  - AI, IoT, cyber-physical systems, etc.

# Security research from 1991 - 2026

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# Security research from 1991 - 2026

- Security advancement over the decades:
- Computer security ➡ Information systems security ➡ Information security ➡ Cybersecurity
- All during my research career
  
- How has the research approach changed?

# Research design from 1991 - 2026

- **Computer & systems security era:**
  - Very ad hoc and informal
  - Technical, mathematical, etc.
  - Very positivistic orientated
- **Information security era:**
  - Involving humans
  - More structured design and research methods
  - Became more essential, rather than optional
  - More phenomenalist & interpretivism oriented

# Research design from 1991 - 2026

- Cybersecurity era:
  - The rise of the human factor
  - Complexity of real-world systems
  - Interdisciplinary influence
  - Very much mixed methods

# Research ethics from 1995 – 2025

- Research ethics grew in importance
  - Research began affecting people, not just machines
  - The rise of the Internet and mass data collection
  - Cybersecurity research can cause harm if misused
  - Shift towards human-centred research
  - Legal and institutional pressures
- Research moved from controlled technical environments to complex, human-centered, high-impact contexts where harm is possible

# Research of Rossouw von Solms from 1995 – 2025

- AI analysis of my  $\pm 250$  peer-reviewed research papers from a focus point of view:
  - “Over the past 30 years, Rossouw von Solms’ research has evolved substantially from a primarily technical and control-oriented focus on information security to a broad, multidisciplinary perspective encompassing cybersecurity governance, human factors, organisational culture, and societal impact.”

# Research of Rossouw von Solms from 1995 – 2025

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  - “....., the scope of his work has expanded to include business, human, and national dimensions of cybersecurity, reflecting a shift from a positivistic paradigm toward a more holistic and human-centered approach.”

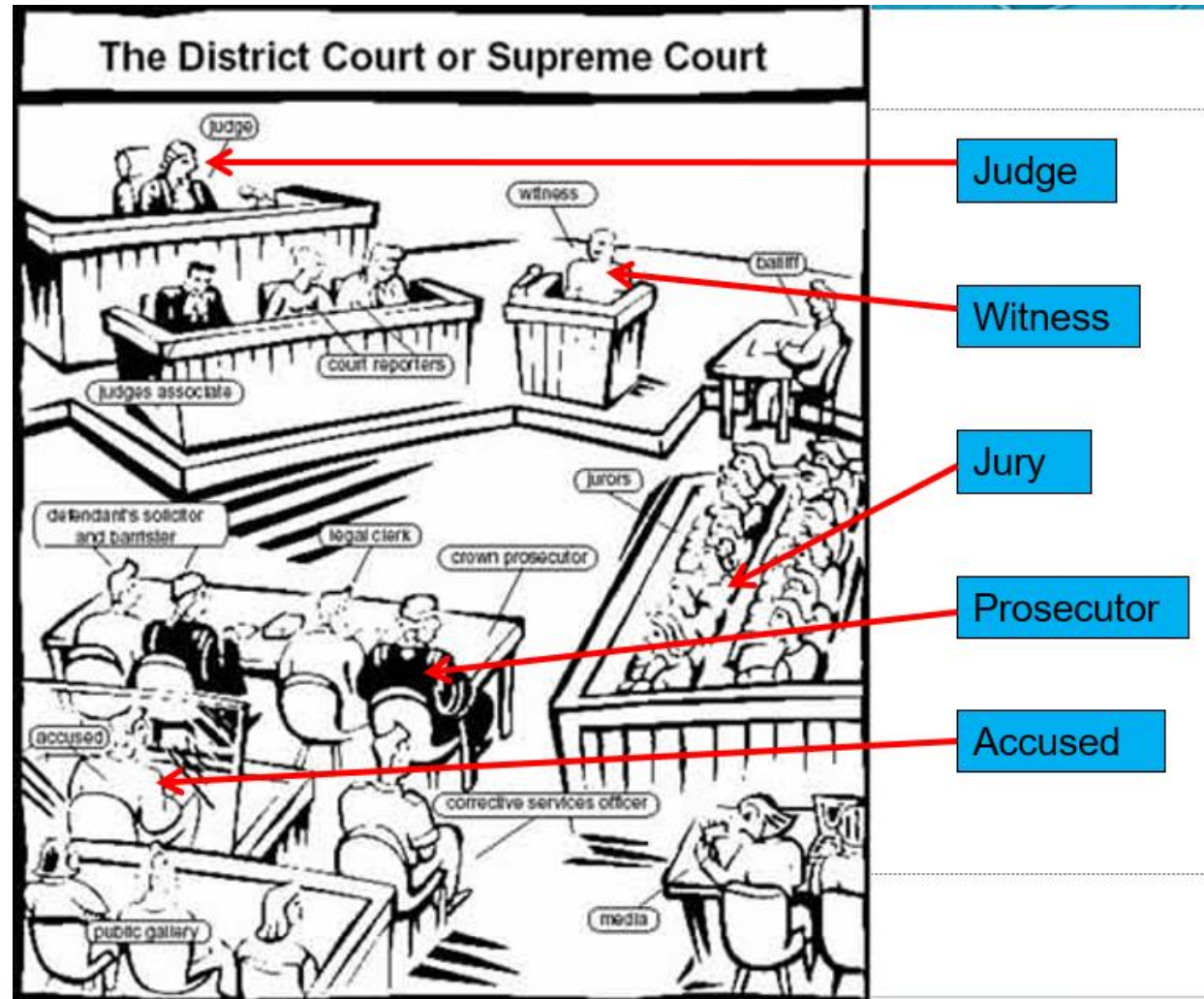
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# Research of Rossouw von Solms from 1995 – 2025

- AI analysis of my  $\pm 250$  peer-reviewed research papers from a research design point of view:
  - “The evolution of research design, methodologies, and methods in the work of Rossouw von Solms is quite structured and mirrors the broader development of the cybersecurity field itself.”

# Cybersecurity research of today - An analogy



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  3. To prove or disprove the charge is the real goal of the court case
  4. The prosecutor gathers trustworthy evidence to use in the case

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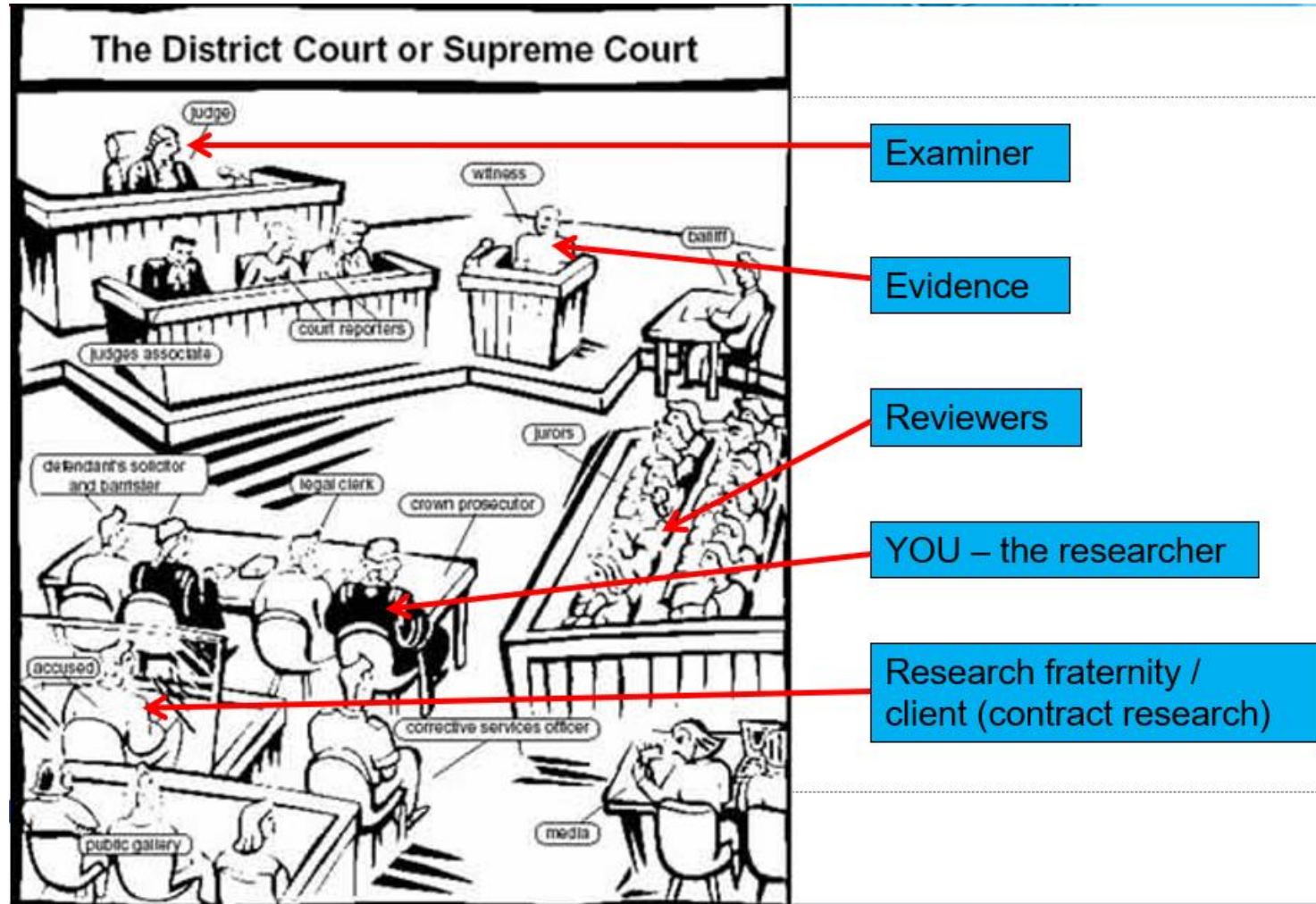
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  8. If the charge is upheld, answers are provided to the question or a solution is provided to the problem

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  4. Research evidence is gathered through sound research methods

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  8. If the thesis statement is upheld, then the question is answered, or the problem is solved.

# Research – Publish or Perish

- How I managed my research career
  - “*Publish or Perish, but where?*” – published in SACJ
  - How do you know the impact of your research – citations
  - Citations – indication of:
    - Impact of the paper to other researchers (number of citations)
    - Impact of you as a researcher (h-index)

# Research – Publish or Perish

## ■ Google Scholar data

- Citations – 14907

## ■ Where did I publish:

- Six papers with most citations – Computer & Security (2193, 813, 775, 659, 537, 524 respectively)
- 22 Papers in C&S attracted 8041 citations
- 84 Journal papers attracted 13061 citations
- First conference paper – 33<sup>rd</sup> with 96 citations
- $\pm$  150 conferences attracted about 1846 citations

# Research – Publish or Perish

## ■ Manage your own career

- Publish good research in well-indexed journals, preferably C&S
- Use conferences to build research links, get guidance, etc.
- Partake in IFIP events and build strong research links
- Develop with your discipline, even try to be ahead
- Do not try to be a *Jack of all trades, but master of none*
- Research career is a marathon, not a sprint

# Research – Publish or Perish

- Citations core to me receiving an IFIP Fellowship
- Citations surely contributed to my academic profile and play a role to be the 2026 KB recipient
- Get a healthy balance between published research and organizational management and participation

# IFIP, TC11, Kristian Beckman & me

## ■ Rossouw von Solms and Kristian Beckman

- The journey with IFIP was:
  - Very enriching
  - Academically stimulation
  - Made friends for life
  - Saw the world
  - Made me a better and more appreciative person
- Thank you to the KB committee for honouring me
- Thank you IFIP for what you meant to me
- Thanks to my Creator for blessing me in this way

**Change the World**

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