Heli Kurikka on resilience – online only

Feb 16th 2026 at 14.15-15.45 (LIVE online - will also be recorded and posted on the website)
Heli Kurikka is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting
https://tuni.zoom.us/j/63722140758?pwd=qvoZ0wNvs9ybAsGAxMBW4CZp7tcGnE.1
Meeting ID: 637 2214 0758
Passcode: 413506

Path development and proximity

Criticism: many of the theories and models related to economic development of regions and innovation systems are too static

→ Path development

Path dependence and path creation

- Path dependence and path creation (also referred to as new path development) are key concepts in regional development studies (Hassink, Isaksen & Trippl, 2019)

- Path creation or new path development is about 'the emergence and growth of new industries and economic activities in regions'(MacKinnon, Dawley, Pike, & Cumbers, 2018a)

Path dependency

- Explains a current state of affairs from its history
- Explains how existing industrial structures preserve what already is
- Explains how industrial restructuring is slowed down

Processes generating path dependency

David’s network externality

- Technical interrelatedness
    - the reinforcing effects of complementarity and compatibility among the different components of a technology and its use
- Economies of scale
    - the benefits associated with the increasing use of a technology—such as a decline in user costs—as the technology gains in acceptance relative to other systems
- The quasi-irreversibility of investments
    - the difficulties of switching technology-specific capital and human skills to alternative uses

Arthur’s increasing returns effects

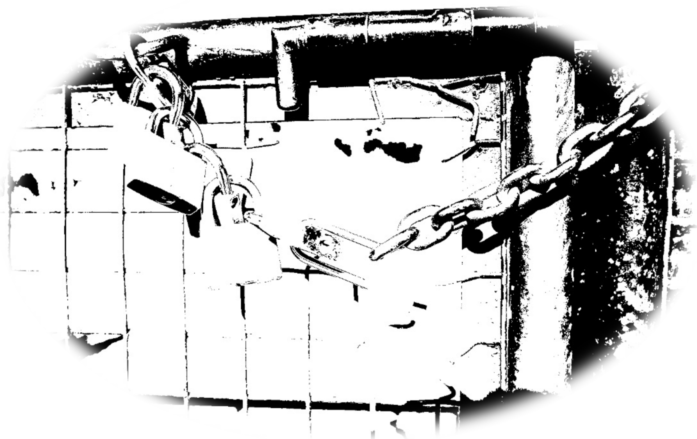
- Large initial fixed setup costs
- Dynamic learning effects
    - learning by doing or using and learning by interaction tend to entail positive feedbacks
- Coordination effects
    - confer advantages to going along with other economic agents taking similar actions
- Self-reinforcing expectations
    - when the increased prevalence of a product, technology, process, or practice enhances beliefs of further prevalence

(Martin 2010)

Lock-ins

- Structural lock-in
- Cognitive lock-in
- Political lock-in

(Grapher, 1993)



Institutions carry history and lock-ins

Table 1. The key dimensions of particular evolutionary pathways of a decline.

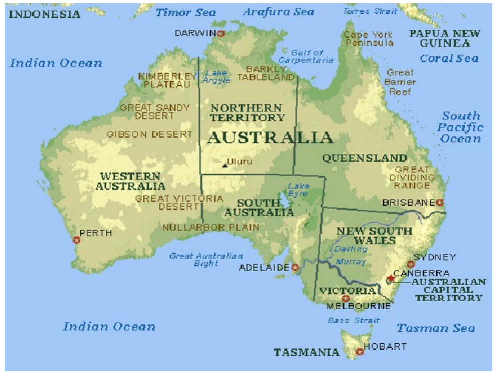
	Firm-level		Key dimensions			Region-level: Modification of the regional asset base		Empirical illustrations	
Path	Strategies	Main drivers	Connectedness	Capital accumulation	Resilience	Main alterations	Future potential	Example	Reference
Down-grading	Removal of higher value-added functions	FDIs driven by low-cost strategies / intensive competitive pressure	Internal: decrease; external: increase	declining	declining	Loss of key assets	Risk of being trapped in lower-quality segments	• South East of Bulgaria (apparel, 1990s) • Non-metropolitan regions in Philippines (voice-based services, 2000–2013) • Daegu (textile, 1980–2005)	• Pickles, Smith, Buček, Roukova, and Begg (2006) • Kleibert (2016) • Hassink (2010)
Contraction	Reduction of product diversity / re-specialization	Weak competitiveness in the global economy	Internal: decrease; external: increase	declining	varying	Risk of over-specialized assets	Diminishing opportunities for diversification	• Pittsburg (steel, 1980–2005) • South Birmingham (automotive, 1970–1980s) • Teeside (steel & chemicals, 1960–1980s) • Luxembourg (financial services, 1990–2014)	• Treado (2010) • Smith (1989) • Beynon et al. (1989) • Dörry, (2015)
De-localisation	Relocation to more favourable locations	Better cost-capability ratio, more suitable frameworks or availability of resources at other locations	Ultimately declining (internally & externally)	Dis-investment	sharply declining	Broad destruction and de-locking of assets	Severe effects on long-term development potentials	• La Laguna (textile, 2000–2010) • S. Korea (retail, 1999–2015) • S. Australia & Victoria (automotive, 2000–2017)	• Bair & Werner (2011b) • Coe et al. (2017) • Beer (2018)

Source: Own compilation.

The closure of the Australian car manufacturing industry (Beer 2018)

Was decline inevitable, and was it the product of a strong currency buoyed by a mining boom?

What	Announced (Closure)	Outcome
Toyota	2014 (2017)	• 30 000 jobs in South Australia • 100 000 jobs in Victoria
General Motors Holden (GMH)	2013 (2017)	
Ford Australia	(2013)	
Mitsubishi	(2008)	
Nissan	(1992)	
Chrysler	(1981)	
Leyland	(1971)	



- All sectors are potentially vulnerable in a globalised economy
- Relative labour costs alone are not the sole determinant of an industry's capacity to survive

Why

- A peripheral position in global production networks -> limited knowledge base and innovation capacity
- No supportive industrial ecology around the major producers - limited knowledge base and innovation capacity
- The small scale of local production - no cluster effect
- High cost structures relative to competitor plants
- A strong currency
- The shifting priorities of parent corporations

(Beer 2018)

”Old Industrial Regions can be regarded as the Industrial Districts of the past: initial strengths - industrial atmosphere, specialized infrastructure, close inter-firm linkages, strong support by regional institutions - turned into stubborn obstacles to innovation”

(Grabher 1993)

Ron Boschma: Proximity and Innovation: A Critical Assessment

https://youtu.be/_u48rBMltN8

Ron Boschma

Table 1. Five forms of proximity: some features

	Key dimension	Too little proximity	Too much proximity	Possible solutions
1. Cognitive	Knowledge gap	Misunderstanding	Lack of sources of novelty	Common knowledge base with diverse but complementary capabilities
2. Organizational	Control	Opportunism	Bureaucracy	Loosely coupled system
3. Social	Trust (based on social relations)	Opportunism	No economic rationale	Mixture of embedded and market relations
4. Institutional	Trust (based on common institutions)	Opportunism	Lock-in and inertia	Institutional checks and balances
5. Geographical	Distance	No spatial externalities	Lack of geographical openness	Mix of local 'buzz' and extra-local linkages

Close intra-regional interdependence may turn against innovation

- Shared worldview and groupthink
- Focus on improving the old and not on developing new trajectories
- Adapation is difficult

- Perfect adaptation to a specific local environment and internal coherence
    - Stable inter-organisational linkages (Functional)
    - Personal relations and related knowledge (Cognitive)
    - Tightly knit politico-administrative system (Political)

(Grapher, 1993)

Why do well-doing cities/regions turn into stagnant regions?

- Stable trust-based linkages between regional core firms and other actors
- Reduce transaction costs but do not boost innovation
- Long-term R&D becomes an end in itself

- Source of ideas too narrow
- Quality of marketing and distribution too local
- Localized personal connections rather than constantly evolving open networks

Table 1. *Types and mechanisms of regional industrial path development.*

Forms of path development	Mechanisms
Path extension	Continuation of an existing industrial path based on incremental innovation in existing industries along well-established technological trajectories
Path upgrading	
I—Climbing GPN	Major change of a regional industrial path related to enhancement of position within global production networks; moving up the value chain based on upgrading of skills and production capabilities
II—Renewal	Major change of an industrial path into a new direction based on new technologies or organisational innovations, or new business models
III—Niche development	Development of niches through the integration of symbolic knowledge
Path importation	Setting up of an established industry that is new to the region (for example, through non-local firms) and unrelated with existing industries in the region.
Path branching	Diversification into a new related industry for the region building on competencies and knowledge of existing industries
Path diversification	Diversification into a new industry based on unrelated knowledge combinations
Path creation	Emergence and growth of entirely new industries based on radically new technologies and scientific discoveries or as an outcome of search processes for new business models, user-driven innovation and social innovation

Source: own elaboration, inspired by (Isaksen et al. 2018)

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Machinery in Tampere

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Kimono cluster in Kyoto

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Car industry, case Tesla

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Data centres

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From pulp and paper to biofuels

Estimate: In road transport, over 93% of its energy coming from fossil fuels.

In aviation, appr. 99 %

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From cruisers to hotels or amusements parks

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Personal computers

Key mechanisms in path development

Path creation

- Innovative entrepreneurship & venture capital
- Forefront academic research
- Science policy
- Licencing/patenting
- Ties between academics and entrepreneurs
- Creation of industry identity
- Standard-setting
- Evangelists

Path importation

- Re-education
- International marketing and networking
- Technical assistance

Path Branching/ diversification

- Bridging between disconnected actors
- Filling structural holes
- Creation of an industry identity
- Re-education
- New curriculas

Path upgrading

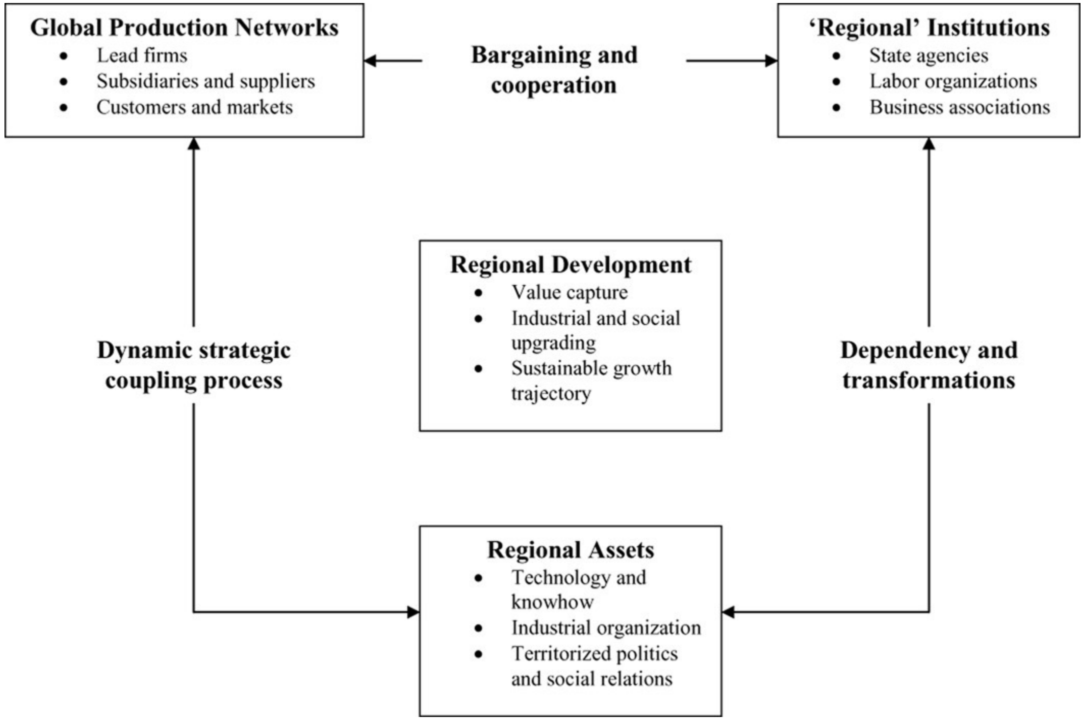
- Problem-solving for industry
- Re-education
- Global best practice scanning
- Enhancing market hunch and knowledge of customer needs
- Foresight

(Modified from Lester 2005; Lester & Sotarauta 2007)

Security-conditioned path development in Tampere

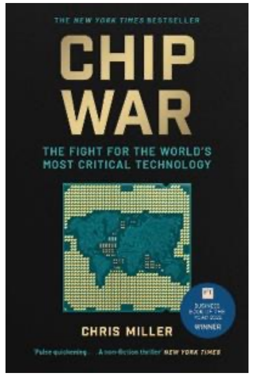
We cannot talk about local/regional development without understanding global changes

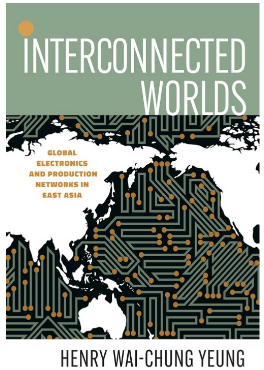
We cannot talk about economic development at national level without understandig what's going on in our localities and regions

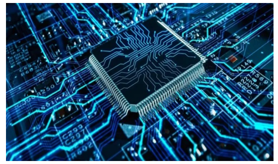


Now – geopolitical shifts and challenges

- Geopolitical tensions
  - US-China trade wars
  - War in Ukraine
- Technological competition and rapidly evolving markets
  - US sanctions on Chinese semiconductors; leading-edge chip making; global chip shortage in automotives; etc.
- Manufacturing dependency on China
  - Not easy to move production from place to place – an entire ecosystem needed





A Chip War?

It’s hard to imagine a world without microchips. They’re at the heart of the devices that we use to work, travel, stay fit and entertain ourselves – from cars to smartphones and from MRI scanners to industrial robots and data centers

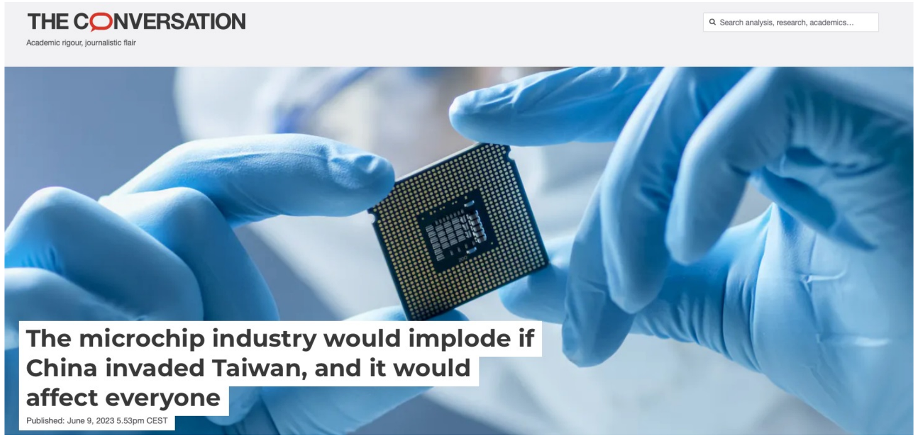
Chip features are measured in nanometers.

A nanometer is one billionth of a meter, or a millionth of a millimeter.

The smallest chip at the moment is below 2 nm

A hair is 100,000 nm

Why are we so worried about China/Taiwan relationships?



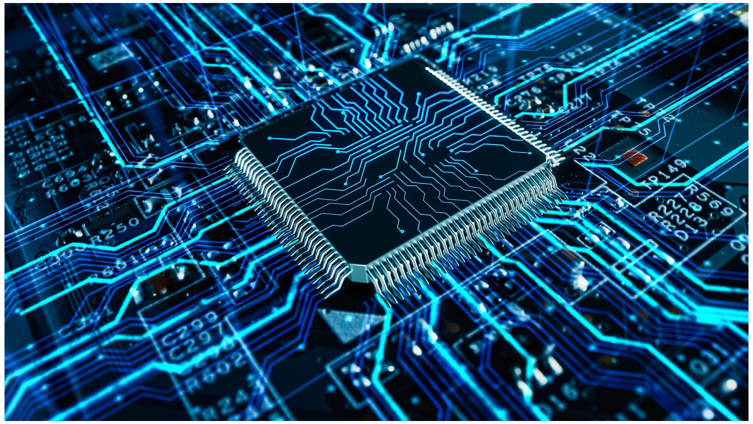
- Design often stemming from US, Japanese or European firms
- Manufacturing taking place in Taiwan and South Korea
- Manufacturing extremely complex – advanced machines and skilled labour called for
- Close collaboration between Silicon Valley and Taiwan
- Taiwan alone manufactures more than 60% of the world's semiconductors — and crucially, 90% of the most advanced ones

Taiwan Semiconductor Manufacturing Company (TSMC)

ASML in the Netherlands

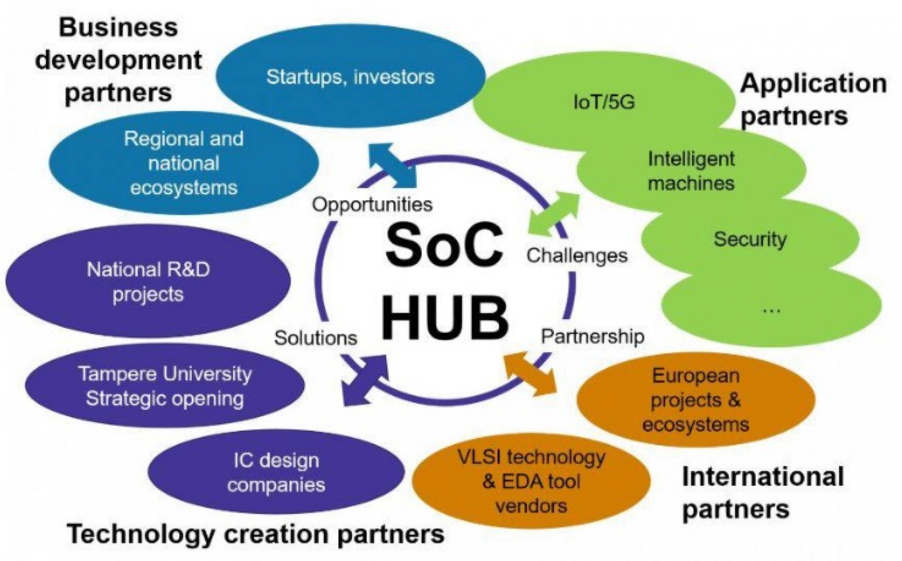
Geopolitical shifts and challenges in chip economy

- Defensive and protectionist interventions
    - CHIPS for America Act / $52 billion
    - Integrated Circuit investment Fund of China / €150 billion
    - European Chips Act / €46 billion
- TSMC (Taiwan), Samsung, SK Hynix (South Korea) each spending €100-150 billion over the next 3-5 years (incl. investments in the US)



Overcapacity in making?
Demand for mobile phone decreasing

70 companies currently operate in the Finnish semiconductor sector, employing approximately 5,000 people with a combined turnover of almost EUR 2 billion



’Chips from Finland’ Initiative: The World is Fighting for Microchips – Finland Can Become Top in Europe

News item | 17.3.2023 14.10

While the world’s superpowers are fighting for domination over microchips, Finland has excellent chances to become the top in European microchip expertise. To this end, the Semiconductors branch group Technology Industries of Finland, other corporate partners, VTT Technical Research Centre of Finland, Tampere University and Aalto University together with the cities of Tampere and Espoo are proposing a national microchip programme in Finland.

Microchips are used for example in many consumer devices, such as cell phones.

Chips from Tampere – action plan 2023-26

TAMPERE. FINLAND

Source: Petri Räsänen

Activities and objectives 2023-24

- Ecosystem visibility & development
- Development of Chip Act operational models
- Strategic project roadmapping
- Policy influence and EU collaboratíon, Chips from Finland

→

- Chips Competence Centre for Finland
- Design Platform & Centre of Excellence plan
- Pilot line concept and plan
- FI matching funding
- International partnerships

Subprojects and objectives 2025-26

- Chip Design Excellence: education, RDI, new business development
- SiPFAB Pilot Line development
- Global investor and partnership attraction
- Roadmap to advanced chip fabrication

→

- New design centers & startups
- Hybrid System-in-Package Fabrication (SiPFAB)- pilot line
- Application specific microelectronics & photonics SiPS
- Advanced fabrication investments

Nokia 5&6G Roadmap / FI Chips from the North Strategy / Chip investments in EU / Chips JU / SoC HUB + SiPFAB Roadmaps...

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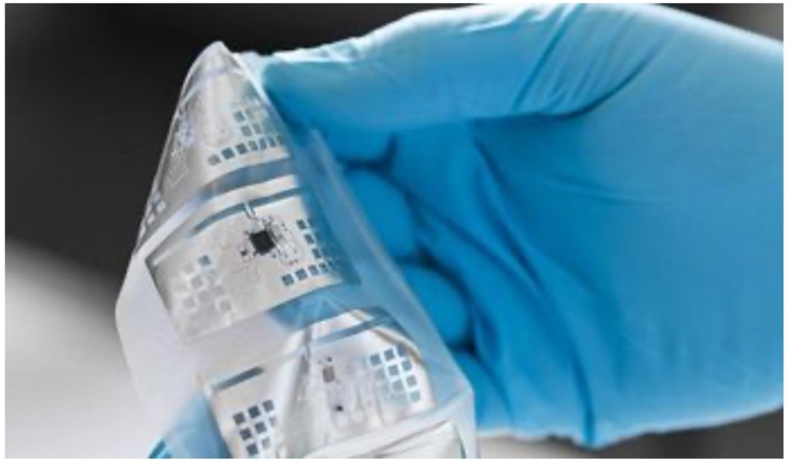
News

A pilot line for semiconductor chip packaging to be built in Tampere – University receives €40 million funding

15.4.2024



Part of the €40 million funding comes from the European Union and part from the Finnish government. In total, the EU has selected four pilot line proposals to significantly enhance Europe's self-sufficiency in microchips in the coming years.

Lue seuraavaksi

Would you rather have a match-box or a Tic Tac under your skin? A Tampere-based company aims to dominate the world of small smart implants

News | 17.5.2024

Winse Power from Tampere, Finland admitted into the European Space Agency Business Incubator program

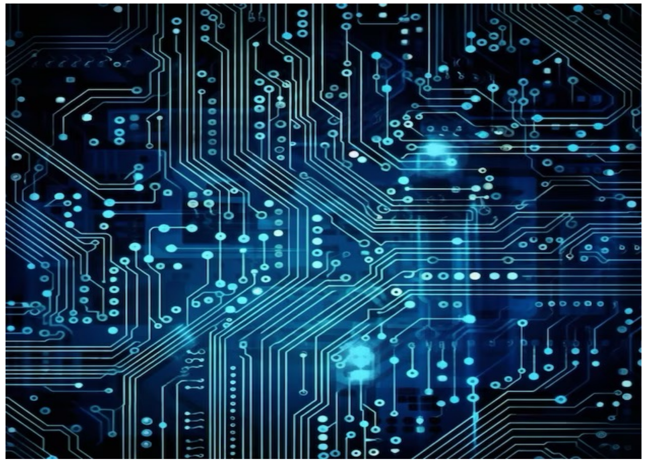
News | 11.12.2023

Tampere region strengthens its investment in the chip industry

News | 22.6.2023

Tampere University is a partner in the WBG Pilot Line. It focuses on developing wide bandgap (WBG) semiconductors and testing and integrating WBG chips

WBG is next-generation semiconductor technology with a wide range of applications (in motor control systems, battery management systems, fast charging systems, photovoltaic inverters, power supply systems and 5G base stations)



Strategies, policies, initiatives

- European Chips Act (2023) European Commission
- Microelectronics Strategy – Strategy (2023)
  - Nokia Oyj, Tampere University, Aalto University, VTT and cities of Tampere and Espoo
- Chips from Tampere (2023)
- Chips from the North - Semiconductor Strategy for Finland (2024)
  - Technology Industries of Finland

Security-conditioned path development - the building blocks in Tampere

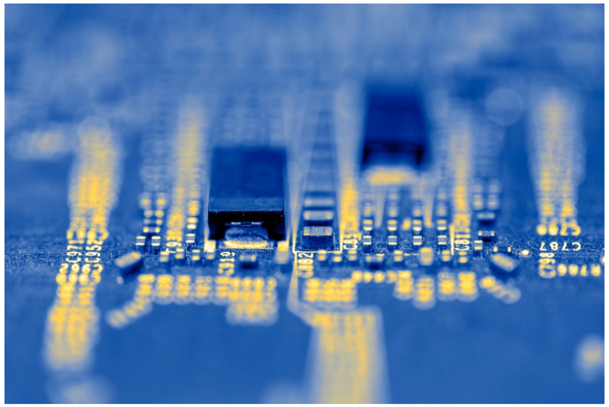
- **FiCCC – Finnish Chips Competence Centre** was established to accelerate industrial digitalisation through microelectronics. The centre operates at Tampere University’s Hervanta campus (2024)

- **SiPFAB – System-in-Package Pilot Line** is a platform where companies can develop and test next-generation chips in collaborat ion with the university. Construction of the pilot begins in 2026. (2024)

- **SoC Hub (System-on-Chip)** is a collaborative platform for system-on-chip design jointly operated by Tampere University and industry partners (2023)

Tampere Region Selected to the Presidency of the European Semiconductor Regions Alliance, ESRA

https://businesstampere.com/en/blog/2025/09/30/tampere-region-selected-to-the-presidency-of-the-european-semiconductor-regions-alliance-esra



Thank you!