

Further HCI

Alan Blackwell and Luke Church

Overview of the course

- **Theory driven approaches to HCI**
- Design of visual displays
- Goal-oriented interaction
- Designing smart systems (guest lecturer)
- Designing efficient systems
- Designing meaningful systems (guest lecturer)
- Evaluating interactive system designs
- Designing complex systems

Lecture 1: Theory driven approaches to HCI

What is a theory in HCI? Why take a theory driven approach to HCI?

Why theory in HCI?

A screenshot of a web browser window showing the printer's network configuration. The title bar says "HP Color LaserJet M452dn 19 X". The address bar shows "192.168.1.55/info_config_network.html?tab=Networking&menu...". The page header includes the HP logo, the printer model "HP Color LaserJet M452dn", and a "Home" button. The main menu has tabs: Home, System, Print, Networking (which is selected), and HP Web Services. On the left, a sidebar lists various configuration options like Network Summary, Configuration, IPv4 Configuration, IPv6 Configuration, Network Identification, Advanced, Google Cloud Print, AirPrint, Security, Certificates, HTTPS Enforcement, SNMP, Access Control List, 802.1X Authentication, and Firewall. The main content area is titled "Network Summary" and contains sections for "TCP/IP(v4)" and "TCP/IP(v6)". Under TCP/IP(v4), it shows the status as "Ready" and provides details for IPv4 Address (192.168.1.55), Subnet Mask (255.255.255.0), Default Gateway (192.168.1.1), IP Configured By (DHCP), IP Preferred Address Method (DHCP/BOOTP Server), DHCP/BOOTP Server (192.168.1.1), TFTP Server (Not Specified), DHCP Expiration Time (00:23:15), WINS Server (Not Specified), Preferred DNS Address (212.50.160.100), and Alternate DNS Address (213.249.130.100). Under TCP/IP(v6), it shows the status as "Ready" and provides details for Link-Local Address (FE80::1A60:24FF:FEC7:F9E3), Stateless (from Router) (Not Specified), Stateful (from DHCPv6) (Not Specified), Preferred DNS Address (Not Specified), and Alternate DNS Address (Not Specified). The "Network Identification" section shows Host Name (NPIC7F9E3), Domain Name (IPv4/IPv6) (NPIC7F9E3), Domain Name (IPv6 only) (Not Specified), Bonjour Service Name (HP Color LaserJet M452dn (C7F9E3)), Bonjour Domain Name (NPIC7F9E3.local.), and Bonjour Highest Priority Service (IPP Printing). At the bottom is a "Network Hardware Configuration" section.

Installing a family printer in 2017

How would you design this?

Is this a good UI?

How do we know?

Could we improve it?

General
Security and login

Privacy

Timeline and taggi...

Blocking

Language

Notifications

Mobile

Public posts

Apps

Ads

Payments

Support Inbox

Videos

Privacy Settings and Tools

Your activity	Who can see your future posts?	Friends	Edit
	Review all your posts and things you're tagged in		Use Activity Log
	Limit the audience for posts you've shared with friends of friends or Public?		Limit Past Posts
How people can find and contact you	Who can send you friend requests?	Everyone	Edit
	Who can see your friends list?	Public	Edit
	Who can look you up using the email address you provided?	Everyone	Edit
	Who can look you up using the phone number you provided?	Everyone	Edit
	Do you want search engines outside of Facebook to link to your Profile?	Yes	Edit

About Create ad Create Page Developers Careers Privacy Cookies AdChoices► Terms Help

Facebook © 2017

English (UK) English (US) Română Magyar Italiano Español (España) Français (France) Deutsch Türkçe Português (Brasil) العربية



Facebook privacy in 2017

How would you design this?

Is this a good UI?

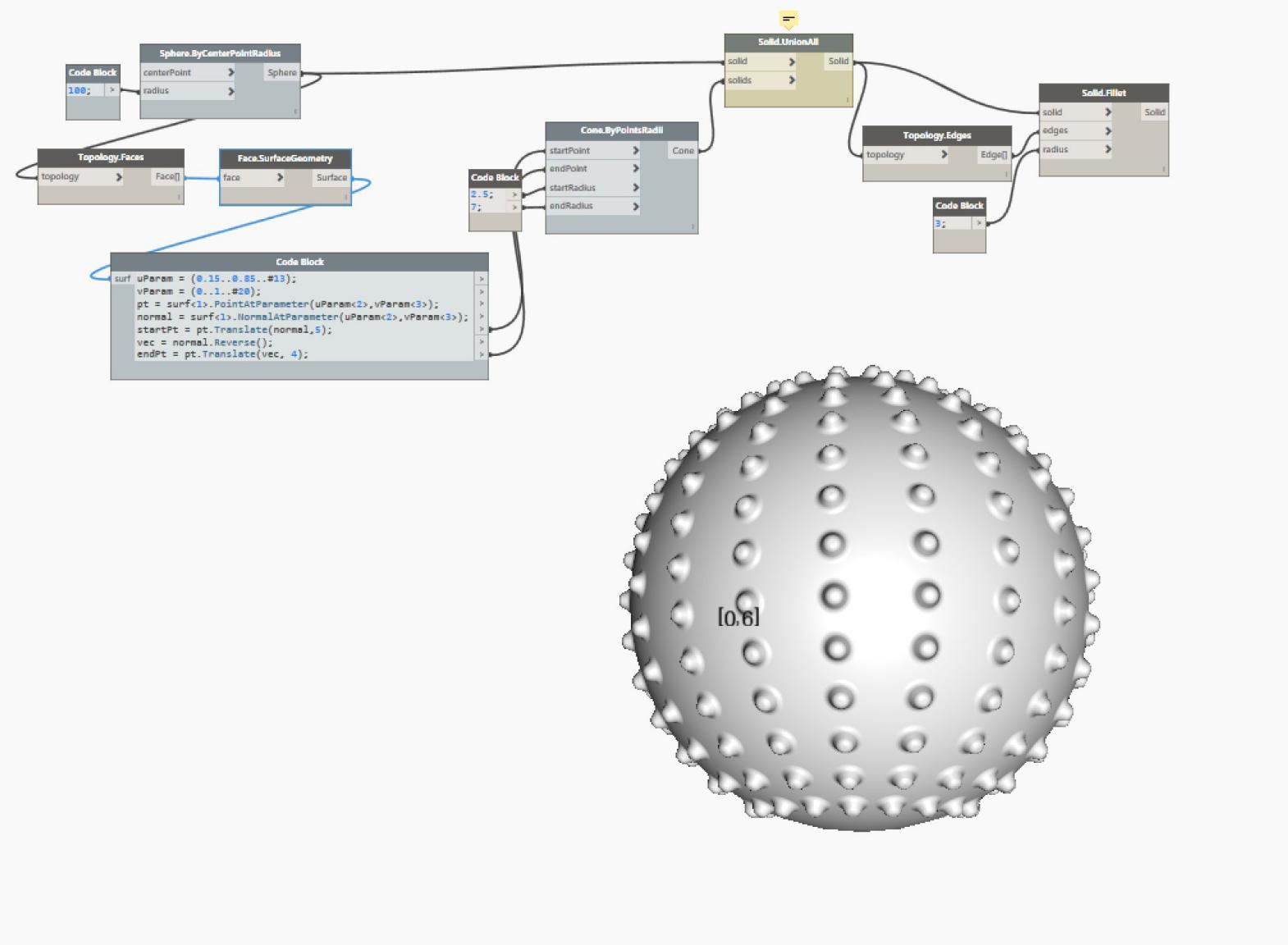
How do we know?

Could we improve it?

Visual Programming in 2017

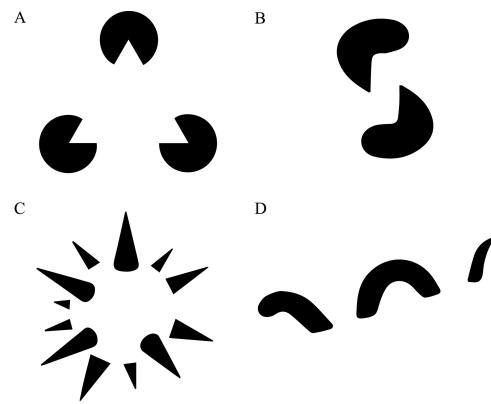
How would you design this?

Is this a good programming language?

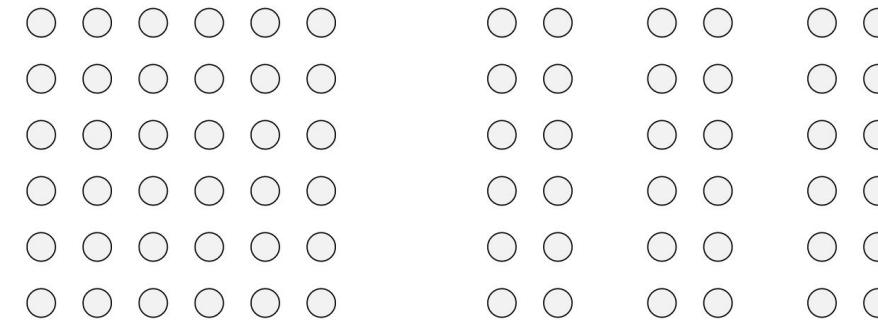


Theories give a *critical perspective*

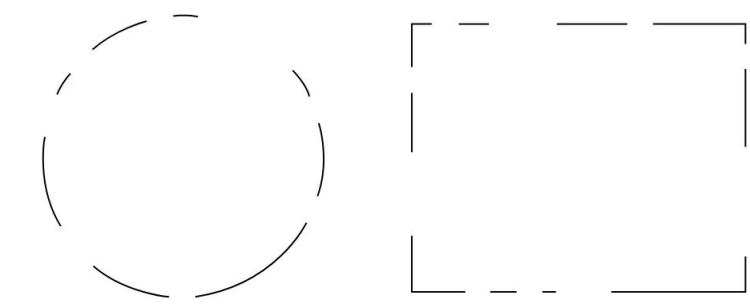
Reminder of a theory: Gestalt theory of perceptual organisation



Continuity

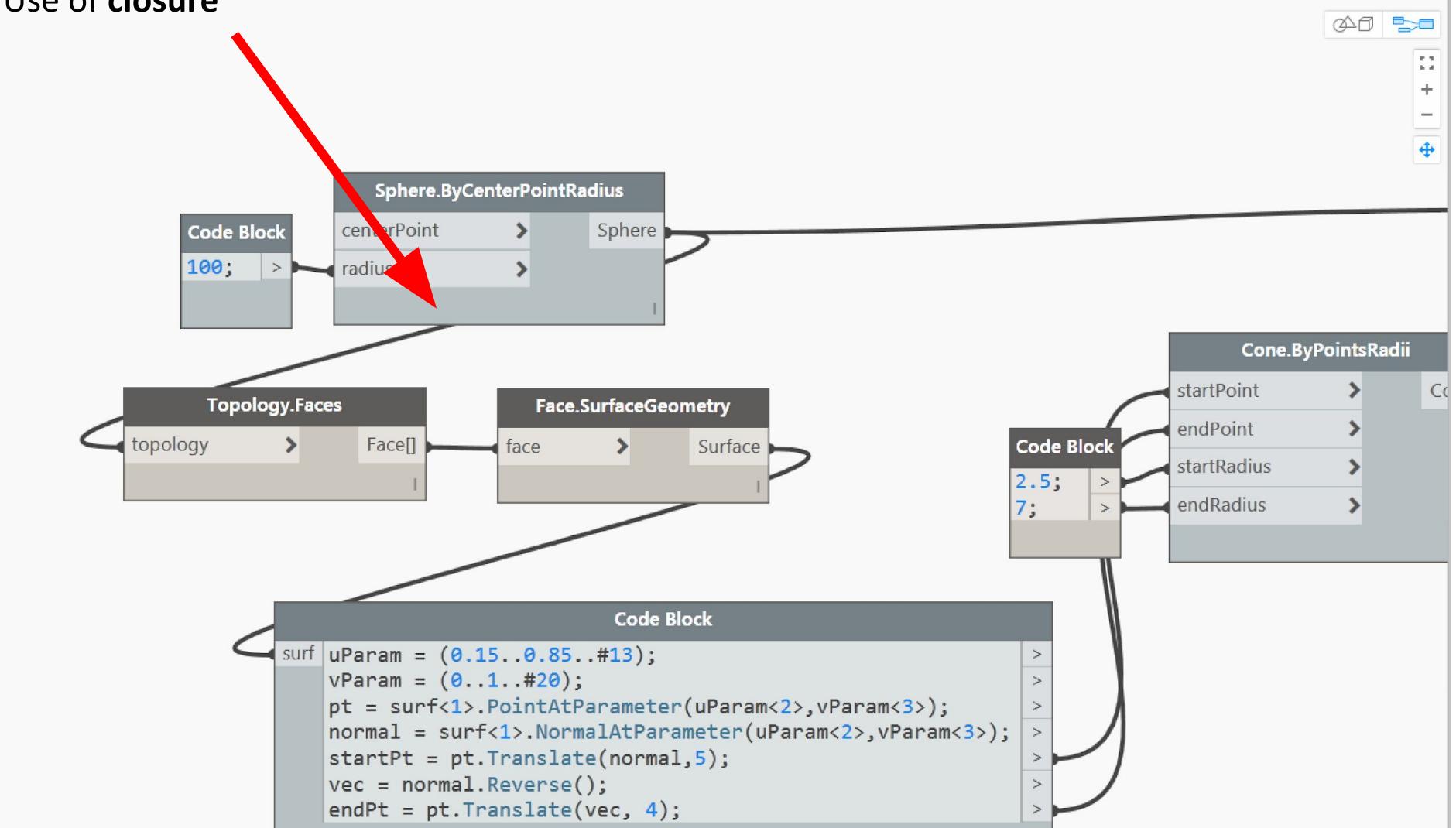


Similarity

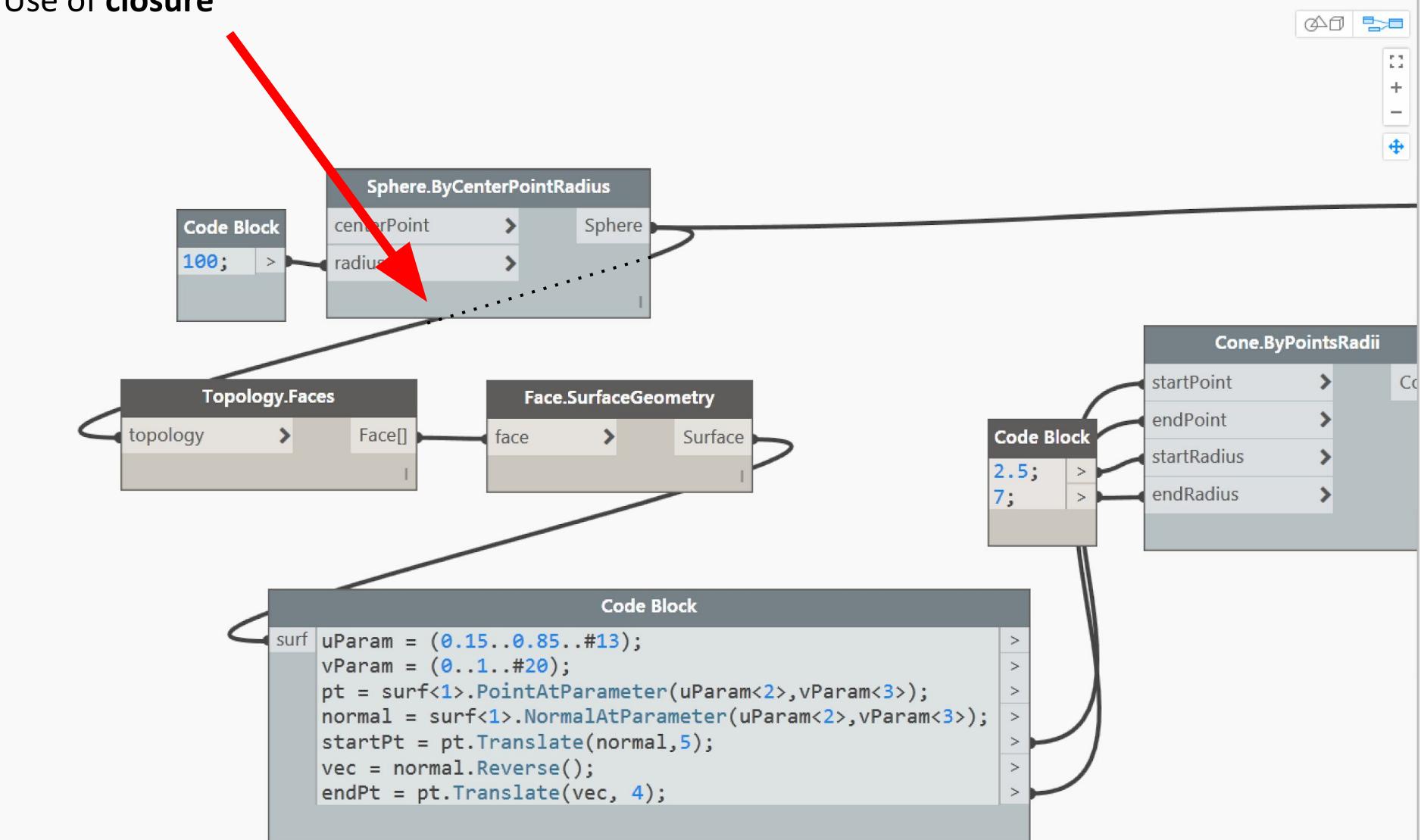


Closure

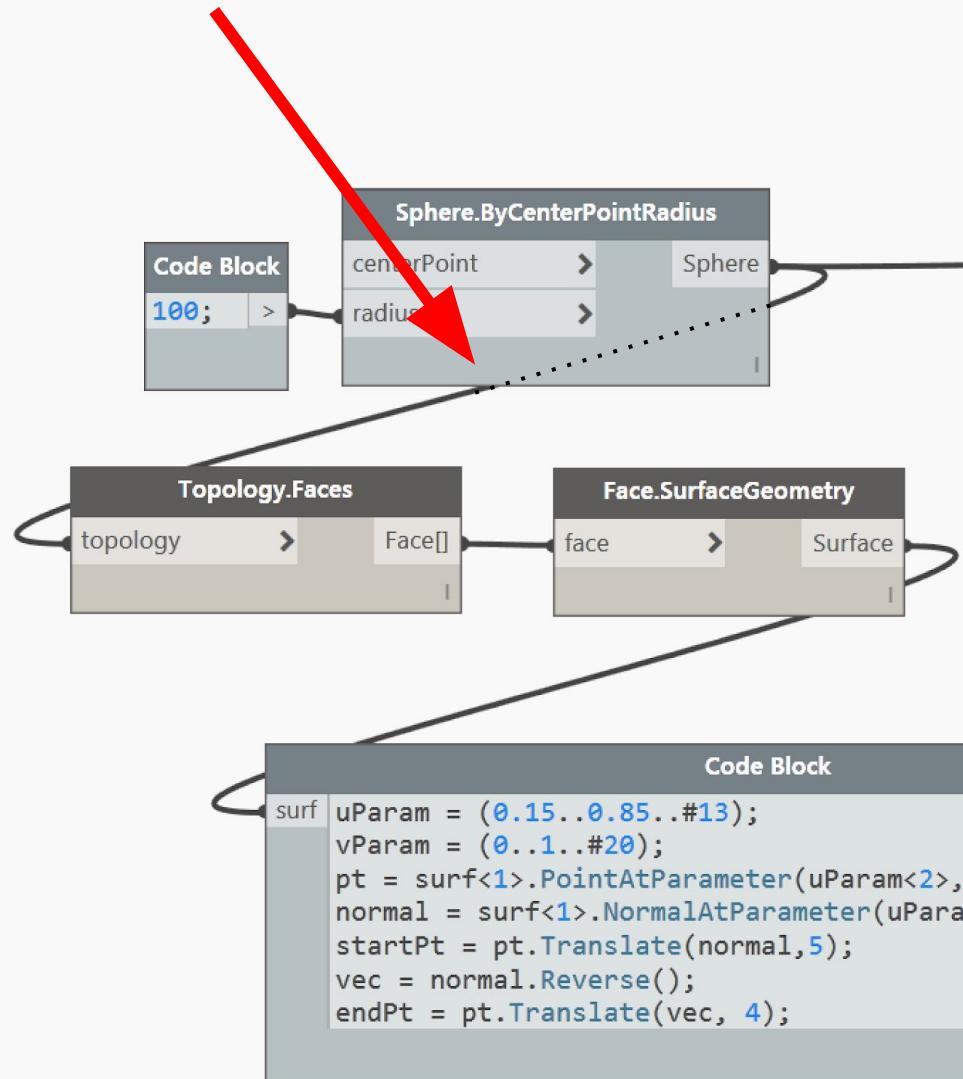
Use of closure



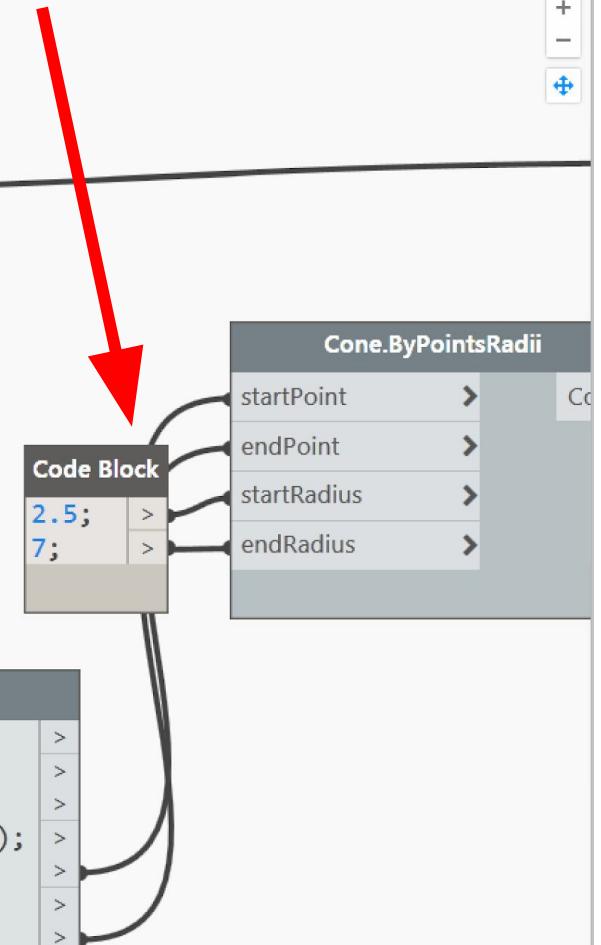
Use of closure



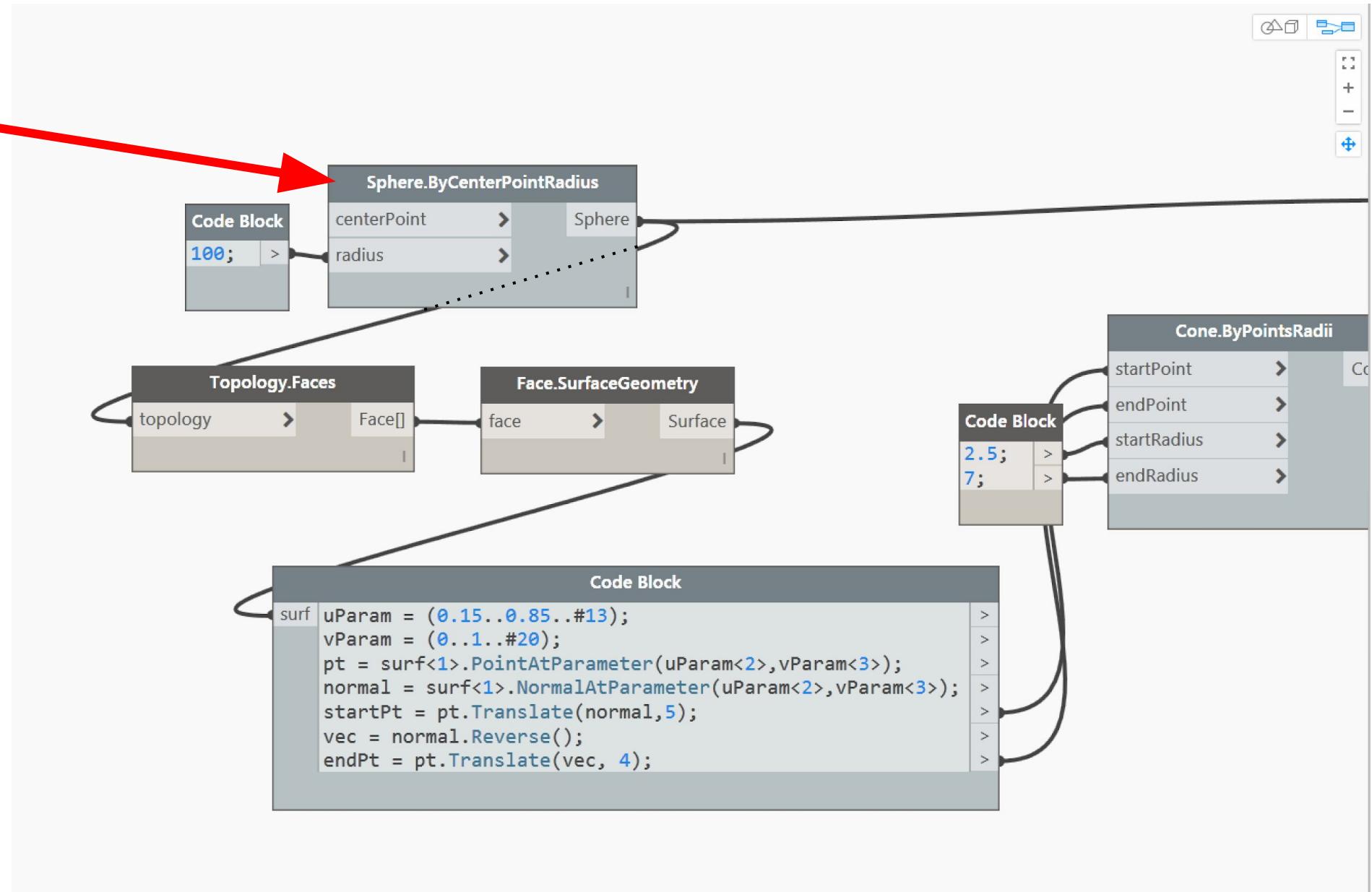
Use of closure



Problematic use of closure

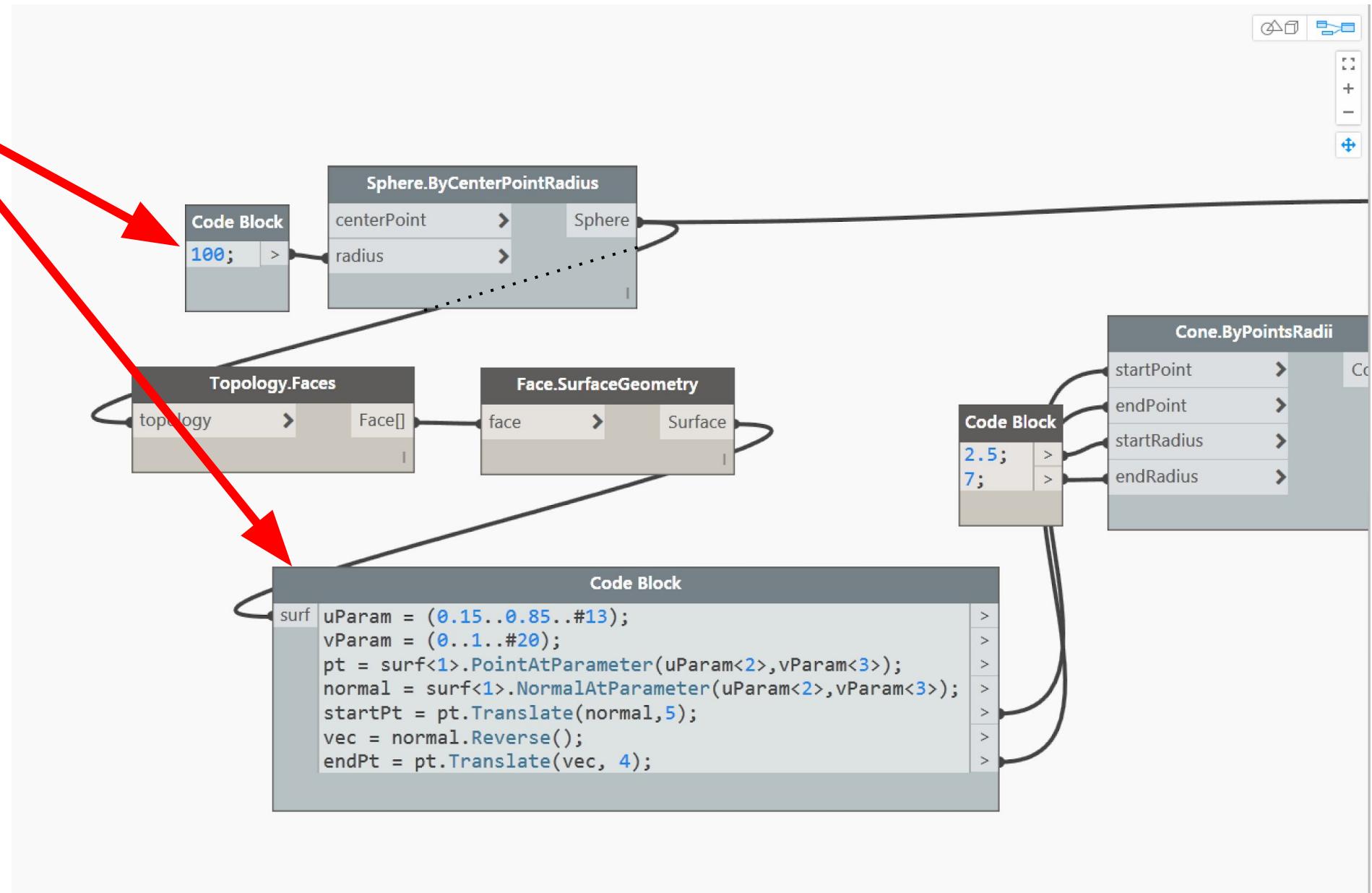


No use of continuity



Problematic Similarity

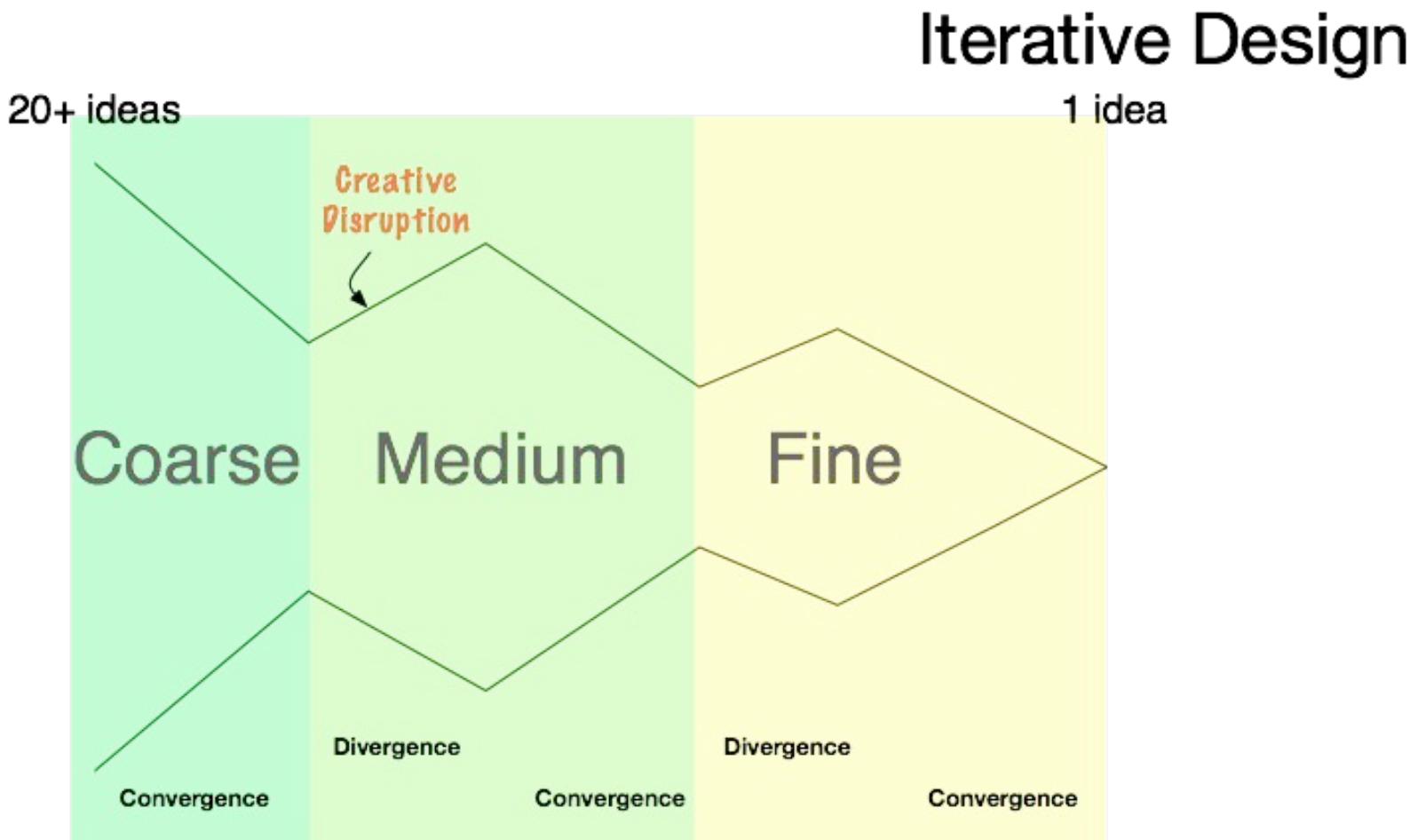
Do users think these are the same?



Summary of gestalt theory application

- Took a candidate design (Dynamo UI)
 - Predicted some properties that probably work well
 - Predicted some properties that might cause problems
- Over the course of the lectures you'll many theories like this
- How do we make use of critique?

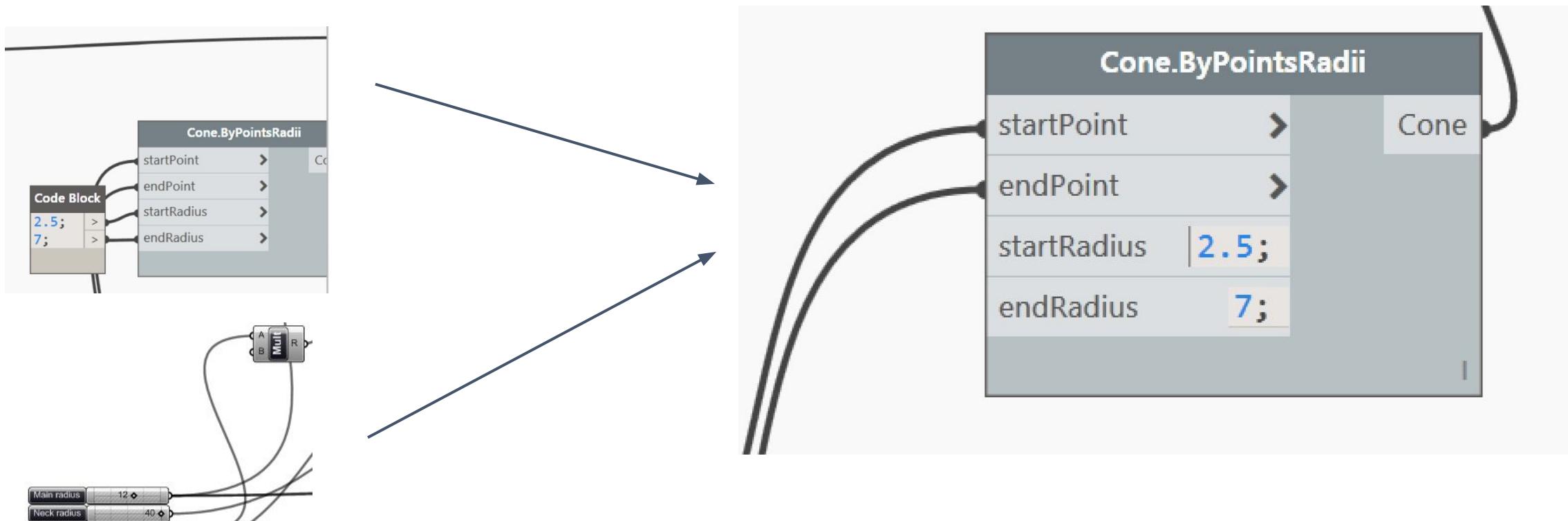
Critique your way to a design



Derived from Pugh '56

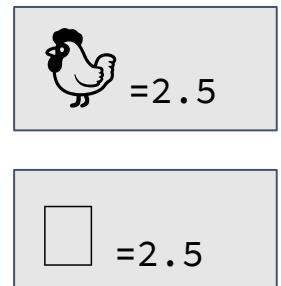
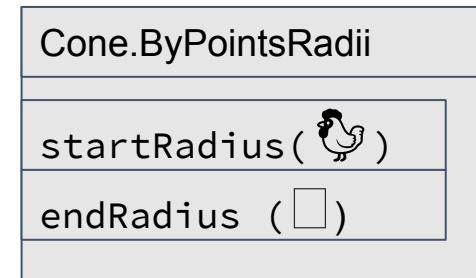
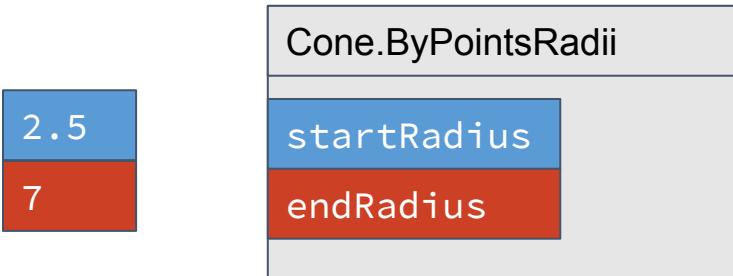
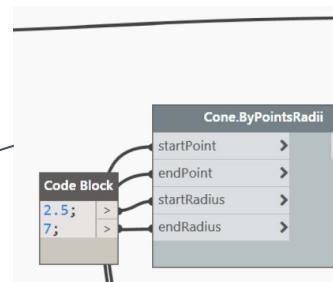
Example of convergence

- Merge features from two candidate designs to produce a better one
- Discard ideas that poorly fit the desired outcome



Example of divergence

- Generate new designs from existing one
- Use any creative technique, e.g. ‘gestalt swapping’, ‘reduction to absurdity’ or exploring metaphors
(e.g. what happens if we replace connectedness with similarity)



(Variables as emoji from Seymour, Kasibatla and Warth, 2017)

Why theory in HCI?

- We're interested in making interaction with computers faster, more productive, more creative, more social, more fun, somehow 'better'.
- Theories give us ways of criticising proposed designs and toolkits for inventing new ones

Three waves of HCI

- First wave (1980s):
 - Theory from Human Factors, Ergonomics and Cognitive Science
- Second wave (1990s):
 - Theory from Anthropology, Sociology and Work Psychology
- Third wave (2000s):
 - Theory from Art, Philosophy and Design



Apollo-Soyuz controls 1975

How would you design this?

Is this a good UI?

How do we know?

Could we improve it?

First wave: HCI as engineering “human factors”

- The “user interface” (or MMI “man-machine interface”) is a separate module, designed independently of the main system.
- Design goal is efficiency (speed and accuracy) for a human operator to achieve well-defined functions.
- Use methods from cognitive science to model users’ perception, decision and action processes and predict usability.



An information system

How would you design this?

Is this a good UI?

How do we know?

Could we improve it?

Second wave: HCI as social system

- The design of complex systems is a socio-technical experiment
 - Take account of other information factors including conversations, paper, and physical settings
- Study the context where people work
 - Use Ethnography and Contextual Inquiry to understand other ways of seeing the world
- Other stakeholders are integrated into the design process
 - Prototyping and participatory workshops aim to empower users and acknowledge other value systems



Blood bag radio

How would you
design this?

Is this a good UI?

How do we know?

Could we improve it?

Third wave: HCI as culture and experience

- Ubiquitous computing affects every part of our lives
 - It mixes public (offices, lectures) and private (bedrooms, bathrooms)
- Outside the workplace, efficiency is not a priority
 - Usage is discretionary
 - User Experience (UX), includes aesthetics, affect,
- Design experiments are speculative and interpretive
 - Critical assessment of how this is meaningful

Specialist topics not covered here:

- Graphics and VR - elsewhere in CS Tripos
- Digital media studies - CRASSH
- Game design - Anglia Ruskin University
- Social network analysis - elsewhere in CS Tripos
- Computer music - elsewhere in CS Tripos
- Security - elsewhere in CS Tripos
- Educational technology - Faculty of Education
- Information Systems - Judge Business School

Alternative perspectives

- Positive computing (e.g. Calvo & Peters 2014)
 - Wellbeing, flow, empathy, mindfulness, altruism
- Inclusion and accessibility (e.g. CWUAAT #1-9)
 - physical and sensory capabilities, ageing, low income and human rights
- Feminist utopianism (e.g. Bardzell 2010)
 - Diagnostic critique of hegemonic research and practice, combined with practice-led participatory processes of anticipation that amplify marginalized voices

Supervisions

- 2 supervisions after lecture 4 and lecture 8, recommend completing all the lectures before the last supervision

Textbooks

- Preece, Sharp & Rogers *Interaction Design: Beyond human-computer interaction* 4th Edition 2015
 - Practical professional methods, with good summary of theory
- Carroll (Ed.) *HCI Models, Theories and Frameworks: Toward a multidisciplinary science* 2003
 - Expert introductions to different theoretical traditions

Exam structure

- 2 of the 10(11 for 50%) questions in Paper 7 focus on Further HCI
 - Candidates answer 5 questions out of 10