



**BHADALE GROUP OF COMPANIES  
- IT AND REAL ESTATE**



**Aug 24 2019**

**Advanced AI Services Catalogue**

**Bhadale IT Developers Pvt. Ltd | Bhadale Real Estate Developers Pvt. Ltd (registration due)**

**Plot No. 52, Hindwadi, Belgaum, KA, India | Mobile: +91- 9741040195 | Website: TBD**

**Bhadale Group of Companies**

Bhadale Group of Companies consists of Bhadale IT Developers Pvt. Ltd and Bhadale Real Estate Developers Pvt Ltd.

1. **Bhadale IT Developers Pvt. Ltd** is an IT and Computer Engineering company

This company provides consultation in areas of cutting edge technologies, research outsourcing, and software consultation related to data center and related engineering practices

2. **Bhadale Real Estate Developers Pvt. Ltd** is a Real estate company

This company provides development of Infrastructure for IT Datacenter and allied sectors. It manages the engineering design, landscaping, civil architecture, presently serving internal projects.

Bhadale Group of Companies has aggressive programs in place to serve the niche market.

**Bhadale IT Developers Pvt. Ltd Programs and Services****IT Division programs**

- 1 Cloud Architecture
- 2 AI
- 3 Digital
- 4 Automation
- 5 R&D services
- 6 Engineering services
- 7 Mentoring Services
- 8 Data center services
- 9 Outsourcing

There are various services offered under each program, details are described below

**IT Division program related services****Cloud Architecture**

- Cloud Enterprise Architecture
- Cloud Business Architecture
- Cloud Information / Website data Architecture
- Cloud Solution Architecture
- Data center Virtualization and Cloud services ( IaaS)
- Cloud Technical Architecture – Project specific
- Cloud ERP Solutions ( SaaS, PaaS)
- Cloud Strategy and Transformation
- Cloud Systems Integration and consolidation
- Cloud Project Management
- Cloud Pre sales support
- Business Needs ( RFI/RFQ/RFP assistance)

- Cloud Quality Initiatives
- Cloud Business Analysis
- Cloud Infrastructure Planning – hardware , network, storage , backup ( IaaS, PaaS)
- Cloud business portfolio assessment services ( workshops)

### **AI**

- Artificial intelligence and advanced machine learning
- Intelligent applications, Intelligent things
- Conversational systems
- Mesh app and service architecture
- Adaptive security architecture

### **Digital**

- Virtual reality and augmented reality: Brief capability, deliverables and service offering
- Digital twins
- Blockchains and distributed ledgers
- Digital technology platforms

### **Automation**

- Robotic Process Automation
- IoT
- Manufacturing robots
- BPO call center robots
- Chatbots
- Remote workers
- Hazardous jobs robots( Mine bombs, nuclear waste, underwater, space etc)

### **R&D services**

- PHD mentor, buddy
- BPO - Outsourced work in areas of research areas related to IT and Computer Engineering

### **Engineering services (Only Engg)**

- Engineering services for Data centers
- Engineering services for IT Departments
- Engineering architectures, drawings, road ways, town house planning, parking, safety, outdoor maintenance, lighting etc
- All other aspects of engineering: Civil, electrical, water and sewage, safety and mechanical motors, pumps, refrigeration, cooling

### **Mentoring Services**

- IT Mentoring
- Engineering Mentoring
- Business Mentoring
- Mentoring for special categories based on age, and disabled
- Mentoring for special professionals like Military and Govt officials under Govt Programs

### **Data center services (Engg + IT)**

- Data center Engineering services
- Data Center IT Services
- Data center Security services
- Data Center QA services
- Datacenter Cloud services
- Datacenter compliances services
- Data center based business solutions

### **Outsourcing**

- Insourcing
- Outsourcing
- Near sourcing
- Cloud sourcing
- BPO services
- IT specific services
- Engineering specific services
- Training specific services

## Service details for Bhadale IT Developers Pvt. Ltd

## IT Division programs – Advanced AI Services



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We have a large set of subcategories; few are mentioned below with details tabulated

Program No	Program Name	Key Program features
1	AI + computer vision for Augmented Reality	<p>We offer product design and services for enhanced uses of Computer graphics, 3D effects, and related use of algorithms. This will provide better visibility of the real processes that offer several benefits to service providers like better management, faster and effective resolution of problems.</p> <p>Few use case that we handle are Immersive Commerce (I-Commerce), Industrial AR, Hololens, Medical diagnosis for advanced surgery or treatments, mixed reality, enhanced body wears, gadgets like eyewear, headgears, watches, home gadgets, Travel guide, risky site visits, hazardous job handling, vision goggles for soldiers, pilot assistants in HUD, on screen display guidance, and virtual mirrors for fashion try outs. Details of few are provided below:</p> <ul style="list-style-type: none"> <li>a) <b>I-Commerce</b> – We offer better customer experience, ease of shopping and enhanced shopping without need of any shopping guides. This is a virtual smart store solution for online shopping. This extends traditional shop with online presence, useful for wholesalers to start online shop without real need of physical showrooms that are expensive to maintain. This helps users to try before buying that ensures their confidentiality and privacy at home. This also offers traditional ecommerce features with assured quality item at your doorstep</li> <li>b) <b>Industrial augmented reality (AR)</b> – We offer solutions that help in better visibility of the existing processes, better resource management, allocation of right personnel, improved productivity and speedier fault management. We use CNN based object recognitions, classifications, computer graphics, standard human</li> </ul>

		<p>computer interfaces, nano-sensors, digital asset management with computer vision digital cameras, storage and enhanced layouts, digital maps, process maps, layered visuals. These files can be embedded or exported in various form factors for notebooks, mobiles, headgears and control panels. We use 5 G industrial standards, scalable for various plant sizes and personalized software modules for various worker categories like office worker, plant engineers, and field workers. We use various neural network technologies for identifications of parts (static and moving), defect detection using 2D and 3D algorithms and rollup of statistical aggregates that enable summarized views and breakups by part component level. We offer semantic segmentation and classification for easier asset tracking right from raw material till product final assembly. We use context- aware AI /ML techniques for better human like decisions, NLP feed integrations for voice based activations, commands and emergency operations to shut down.</p> <p>c) <b>Factory Assembly Line assistance-</b> We offer AI services for various assembly line operations like planning, scheduling, training, simulation, and production. We use software that can be configured to suite various assembly line topologies (forward, split, reverse, merge), digital assistants, chat bots that skim large database to generate MIS / maintenance reports, repair and replacements done with impact analysis. We offer services for real 3D interactions using AR features overlaid onto existing eco-systems, networks and assembling lines</p> <p>d) <b>Quality control</b> – We offer detailed data analysis right from in boarding of raw material up to final assembly and dispatch that ensures full visibility of production life cycle to inspectors for final inspection, clearance and sign off</p> <p>e) <b>Digital Twins-</b> We offer services that enable accurate diagnosis, prediction and effective treatment of engineering or medical conditions. We use clean data that is in generated during original production and data captured during various tests conducted over life span of an individual part/ human body. Early detection of faults, repairs, will help remove major losses arising from serious, unnoticed , unattended issues and hence help reduce risks and insurance liabilities</p>
2	AI + Computer Vision for Mobile Robotics	<p>We design and service <b>Mobile robots</b> used for various purposes like, industrial, commercial and domestic purposes. We offer our partner based Robots that are used for service automation (like a hotel waiter), doing manual tasks and human collaborative efforts. We designs robotic solutions for assisting in tasks that humans may not do well like deep water diver rescue or in anaerobic conditions where oxygen may not be available at high altitudes.</p> <p>We assist in planning, design and maintenance of various robot models. We design models based on business need derived from bio-inspired navigation, drone navigation to military grade soldier assistants that will enable you to get benefits for your business and assist you in your productivity. Few of our specialties are based as below:</p> <p>a) <b>Algorithm types:</b>  Deterministic : fuzzy logic, neural networks, and neuro-fuzzy  Non-deterministic: genetic, particle swarm optimization, simulated annealing, and ant colony optimization  Evolutionary: fuzzy+ non-deterministic, region neural networks, and fast r-cnn.</p>

b) **Area types:**  
Local, global, known terrain, unknown terrain ( blind navigation), indoor, GPS based, 3 point fix navigation, urban / rural terrains, space terrains, under water and dark terrains, and hazard terrains

c) **Strategies:**  
Goal-seeking, Greedy, Swarm Intelligence, Ant-Colony, Bio-inspired rodents, birds, and bats

d) **Use cases:**  
Hazard, Industrial, Reconnaissance, and Domestic

Few of the features we handle are:

- a) **Mobile drive types:** Non-holonomic, and omni-directional
- b) **Mobile robot kinematics:** robot dynamics, stability, control, open/closed loop controls using PID and fuzzy logic
- c) **Mobile Dynamics:** Newton-Euler, and Lagrange dynamic models for differential drives
- d) **Sensors types:** classification, vision, locomotion, gyroscope, environment-light , humidity, speed, altitude, compass, GPS, MEMS , nano sensors, biological purpose, soil / water quality, and food grade etc

We leverage on industry standards that use various techniques as below

- **Control mechanism:** Lyapunov methods, feedback controls, position, tracking trajectories, parking, leader following, messaging- with peers, leaders, centralized/ decentralized, brockett integrators, chained models of differential types, 2,3, 4,n wheeled control and adaptive mechanism
- **Fuzzy:** Intelligent human like controls instead of rule based system, and neural network based controllers
- **Vision:** Industry frameworks, for real to camera aspect, logical and physical metrics, spatial and semantic filters, integration of vision datasets with various sensors, actuators to ensure proper passing of signals and co-ordinates, use of CNN algorithms for region specific filtering, pooling and kernels

We offer solutions for robotic dynamics that is needed for proper movement and locomotion under various ambient conditions, anti-collision, feedback control mechanism for proper movements of limbs and coordination between various robot sensors, parts, and actuators

#### **Path, motion, navigation :**

Our services include **architecture models** like SENARIO, and ROMAN, use of local and global co-ordinate systems, models based on environment maps, occupancy grid mapping / navigation, and potential fields. We use map design using geometric and phenomenological representation.

We design **navigation systems** for major types like relative, absolute and biomimetic types. We leverage the Relative concepts based on inertial navigation systems. For Absolute type we use 3-4 techniques like magnetic, compass, active beacons, land marks and model matching. For Biomimetic we use local navigation and path discovery.

		<p>We harness the Model matching's key feature using SLAM using hybrid models.</p> <p>We design and offer key <b>sensor types</b> based design which are proprioceptive and exteroceptive. For Proprioceptive type we offer solutions for sensing internal state of joints and positions for navigation aid. In exteroceptive type, we offer external sensing based offerings. We further help you in the design of Exteroceptive types that are active and passive. We design system for Active type by synthesizing and injecting interfering signal into the environment and verify the effect whereas for passive type we gather environment information without using any signal.</p> <p>We design <b>sensor networks</b> by combining required sensors in a topology that enables best data fusion and effective signaling. Different types of networks we design are complementary, competitive, cooperative, independent ones based on business needs.</p> <p>We use industry standard <b>robot architecture control systems</b> like reactive/behavioral, deliberative and hybrid types. We also design RAP, TCA and few hybrid versions.</p>
3	AI + Machine vision	<p>We use Computer vision as base for designing machine vision apps. We use a combination of computer graphics, machine learning, dedicated terminals for physical object inspection, finding faulty parts, detecting and extracting features, using algorithms to reconstruct images, 3D restoration and assembly line inspection. Few of these are detailed below:</p> <ul style="list-style-type: none"> <li>a) <b>Parts inspection:</b> We offer design services using Video + still cameras with AI microcontroller, digital signal processing, data storage, inference using trained AI models to detect flaws, faults with high accuracy in real time or in batch processing modes.</li> <li>b) <b>Image segmentation:</b> We use AI algorithms to analyze original records, generate digital version with enhanced features that segment and color images from various domains like engineering and medical tests. We offer apps, system design consultancy for your unique needs or market COTS that can be purchased and customized as per your business needs, domain and science disciplines.</li> <li>c) <b>Context based image retrieval:</b> We offer design and optimization of search engines using computer vision devices to retrieve taxonomy based objects from large records of structured /unstructured files. We offer techniques for faster searches, indexing, tagging of medical records/engineering drawings, and AutoCAD using standard industrial dictionaries, references, common data schemas, and globally available guide books. All these enable deeper and personalized search engine capabilities that can be a unique offering to your client and suppliers.</li> <li>d) <b>Semantic based object detection:</b> We offer semantic services like Object Classification like humans, buildings, cars, missiles, airplanes, faces, and pedestrians, using YOLO algorithms. Other algorithms we use are Viola-Jones framework based on HAAR features, scale invariant feature transform (SIFT), histogram of oriented gradients(HOG), region proposals(R-CNN, Fast R-CNN, Faster R-CNN), single shot multibox detector(SSD),and you look only once(YOLO)</li> </ul>



		<p>e) <b>Object co-segmentation:</b> We offer special case of image segmentation that allows segmentation of similar objects in multiple images or videos. We use CNN and LSTM based methods-spatio-temporal action localization that help in analyzing wide range of objects simultaneously which is a parallel operation</p> <p>f) <b>Segmentation based object categorization:</b> Another special case of spectral clustering applied to image segmentation. We use these for medical diagnosis, mapping and measurement of remote sensing data from satellites, to measure regions and partitioned transport network to identify busy, queued, and blocked roads. Unique techniques of unsupervised clustering helps in easier categorization</p> <p>g) <b>Semantic segmentation:</b> This is not the same as semantic based object detection. This is mainly segment based where in we classify similar pixels, of objects like sheep, dog and other forms. We use CNN with sliding window to ensure better understanding the pixel similarity, co relations and feed the CNN kernel / frames that enable analyzing of nearby pixels and their associations. This helps in faster segmentation of the given frame with various objects</p> <p>h) <b>Instance segmentation:</b> We offer hybrid approaches that make best use of various CNN techniques like in an ensemble that hosts a variety of algorithms and techniques .Few of the combinations are context based, semantic +object detection to understand which pixel belongs to which object.</p> <p>i) <b>Deep object co-segmentation:</b> We offer segmenting common objects of same class with a pair of images. Uses CNN based Siamese encoder,-decoder. We use Tricos that uses tri level class discriminative cosegmentation for image classification</p>
4	AI + Computer vision for industrial and business domains	<p>Below are few of the key market areas where we offer our services using computer vision and deep learning technology</p> <p>a) <b>Automobile:</b></p> <p>We offer design and planning services for automobiles with 2, 3, 4 wheels, trains, aircrafts, space vehicles and underwater systems like submarines, marine robots etc. We design systems that have auto pilot modes, self-navigating system with different levels of controls, full, semi and minimal automation. Our internationally qualified and licensed engineers offer multi-disciplinary services right from planning, engineering drawings, proof of concepts, prototypes and production.</p> <p><b>Self-driving cars-</b>We offer design of functions related to vision, control loop, movement monitoring and real time control, integrating data from sensors, vision and trained dataset, fuzzy logic and complex algorithms in ensemble. We help you in integrating the in-house developed hardware/ software onto the mother boards or auxiliary bays. Our engineers are well aware of the various types of engines right from single stroke to four stroke, diesel, electric, nuclear power, hybrid energy drives. We have serviced military</p>

grade aircrafts for ground clearances and air worthiness and have been involved in key aviation and railway projects.

**b) Retail:**

We offer design of Automated stores, with wide models, configuration and level of automation. We analyze the requirements based on local knowledge of shopper, economic conditions and demand. In our designs we use 3D modeling, reconstruction, deep learning to capture target items/shelf inventory, classify items in real time and update unique shopper dynamic dataset that gets into final basket upon checkout. We assure integrity of the items that are in shopping basket and shelf and raise alarm for any deviations. Our software analysis the shopper's history for discounting, credit history and many more verifications that happen in matter of a minute.

**c) Security / Anti-theft:**

We offer solutions for real time theft and detection of bad history in minutes instead of days using various methods like facial, voice, signatures, motor number plates, and biometrics . We offer solutions that can help understand real intention to cheat using advanced algorithms that help mitigate risks of theft. Our services help read emotions and mind based in body languages and other data available of the target. We help you in warding off intruders who try to confuse / disconnect cameras and can request physical inspection at exit gates / checkout in a big mall. We also offer advanced features like body scans, accurate identification of stolen objects, and use of bio-sensors for smell, smoke, fire and other harmful matters. We can offer counter-measure support, tactical moves, intelligence in case of terror attacks and random firing cases

**d) Parking and lane guidance:**

We design systems for parking guidance, AR cues on screens or suitable map overlays, offer accurate location and voice outputs to help you control your wheel. We assist in design of auto pilot function that can be used if you are unsure to reverse and park in the dark. We offer software for highway lane change guidance based on local laws and identify speedy / unruly / rash cars. We analyze data from live feeds that help avoid accidents and major casualties. We assist you in choosing right Car mounted cameras that offer better data support for CNN based analysis. We help local landscape integration with global data from GPS and offer AR based overlay maps.

**e) Financials:**

We design / offer systems using machine vision for detecting fake notes, banned notes, scanning suspicious serial numbers and patched/altered water marks. We schedule by comparing real and fakes in batch submissions or individual based on priority. We offer verifications for other financial documents like legal tenders, signatures, cheques, genuine tests for credit worthiness that help clearing houses to process in faster time and manually reconfirm the failed ones. We assist in system design using machine vision for real time theft/ warning at remote areas/ ATM, alert messages and tracking of suspected person / location.

**f) Healthcare:**

We help in system design of 2D, 3D radiology images that need to leverage AI technology for analysis, segmentation, and classification of images, regions, parts based on anatomical theories and practical procedures. We help in scanning / analyzing incident sites, accident wounds, damages, and assist personalized recommendations / assisted surgery and postmortem reports. We offer software that annotate medical images automatically, read semantics from text, voice and NLP feeds like medical

		<p>transcription that ensure right medical terms are picked and presented to requestor.</p> <p>g) <b>Warehouse robot:</b> We design engineering solutions using AI+ machine vision+ Robotic technologies for robots working as an individual or in a group for tasks like lifting, pushing, dropping, handling fragile items, stacking, and item wise checkouts. We offer scheduling, routing, dispatching, control mechanisms for most efficient paths and collaboration. Our vision algorithms with automation can help reduce human efforts and can guide robots to complete various tasks with minimal human intervention.</p> <p>h) <b>Merged reality:</b> VR+AR helps real shopper to locate required item to right bins with real time tracker displayed to shopper. Also helps locate missing items, untraceable, reported items in public places and help officers to recover and handover to the owner.</p> <p>i) <b>Machine vision for deep water, sea search operations:</b> Vision cameras and earlier photos scanned to come with prediction of search target. Various data, history and geography of the environment, water density, flow rate and currents all help to identify the target item and give an area of search operation. Useful for deep terrain lost city, mineral, ships, people and marine life hunts. Also used for pollution checks, plastic deposited and dangerous mines.</p> <p>j) <b>SeaTravel guide:</b> Based on roles, interesting vision images, AR pictures are offered, safety procedures cues, dangers are shown</p>
5	Gesture recognition	<p>We offer design services for various models like static gestures, dynamic gestures. These are offline and live modes. These include eyes, hand and body part based motions. TUI, touch-less UI, KUI, and kinetic UI are designed as per use-case. Beyond voice systems, MFA, and various aids for impaired people, can benefit. Use of MEMS accelerators, gyroscopes, strips transducers, motion sensors, all help in tracking every finger and arms positions.</p> <p>We use industry standard algorithms to capture and process data.</p>
6	AI + Computer Vision for Remote sensing (Telemetry + Astronomy)	<p>We design solutions for above and under water activities for GIS spatial imaging, live feed analysis, lost entity detection, probability analysis, triangulation survey, remote surveying and other remote operations using high resolution cameras, image analysis, and predicting possible location, identification and classification of target entities. We assist in deep space image, spectrum, color analysis for emissions, gravity fields of various entities like stars, black holes, near earth objects, space junks etc. AR visions help space station staff to get advanced and enhanced data, energy radiated from sun, flares, harmful radiation from objects, and any danger detection. Aid for auto manned systems, far sight vision, real time analysis for any threats, damages. Submarine visions beyond sight, AR with historical data, dangers, and incidents are offered.</p> <p>Techniques used:</p> <ol style="list-style-type: none"> <li>1. Temporal CNN for classification of satellite image time series. High spatial and spectral satellite image time series-SITS</li> <li>2. SAR ATS-Synthetic aperture radar, automatic target recognition, CNN</li> </ol>

		<p>based umbrella architecture.</p> <ol style="list-style-type: none"> <li>3. Remote scene classification under high noise, using transfer learning.</li> <li>4. GIS maps-enhancements using CNN</li> <li>5. Celestial body remote vision for live streaming analysis.</li> </ol>
7	Deep learning for industries	<p>We offer unique and customized solutions using various algorithms and data structures. We use CNN, RNN, GAN, Encoders, decoders, kernels, pixel level analysis and clean/ correct datasets that are processed by our big data quality process which ensures real facts are available. We also provide derivatives like Fast region CNN, spatial algorithms, 3D image analysis, backpropagation and deep nets. We use transfer learning to infer complex datasets using top networks like Res-Net.</p> <p>We use our expertise in serving major industries mentioned below:</p> <p>a) <b>Oil &amp; Gas:</b> We offer seismic modeling, automated well planning, predicting machine failure, optimizing SCM across upstream, mid stream and downstream. Critical parts are digitized using sensors and mini digital twins are designed that can be cloned and remerged for better distributed efforts from various labs. This helps better visibility of field operations, quick turnaround, and predictive maintenance. Operations management using prescriptive analysis is possible.</p> <p>b) <b>Construction:</b> We offer optimized planning for the sequence and fastest route for building. We use reinforced learning that ensures laying out of bricks, steel, beams, concrete and helps reduce risks. We offer best use of resources to reduce any idle time, using management parameters for fine tuning the algorithm.</p> <p>c) <b>Financials:</b> We offer unique solutions for common issues. We offer text mining solutions to detect insider trading. We mine data from its source without breaking data confidentiality. We process edges and gather only deltas that ensure we get only required data and generate report. We offer hybrid mining that uses emails, chats, videos and video captures that can correlate, extrapolate and predict any warnings. We help in identifying noncompliance for lapsed actions, due dates. We help in CAPM, mapping spot market prices to future market prices using CAPM ratio and algorithmic trading.</p> <p>d) <b>Cyber security:</b> We use pertained model for intrusion detection and abnormal activities. We also design functions and hybrid stacks that fit your unique corporate requirements.</p> <p>e) <b>Social media:</b> We offer sentiment analysis, scoring, segmenting, terror related activities, early warnings from chain emails or suspicious texting, identifying law breakers, and also offer merit based scores of humans based on interest.</p> <p>f) <b>Climate change:</b> Given proper datasets and environmental feeds, we can predict near future forecasts.</p> <p>g) <b>Environmental quality:</b> We offer quantity analysis for air, water, soil, image analysis, segmentation, various</p>

waste analysis, plastics and pollution. We offer system design of engineering products, software, hardware, interface design and many more related finer details

**h) Voice activated assistants:**

We offer maintenance and personalized offerings based on your apps, Apple Siri, Google Now.

**i) Sales marketing:**

We offer services for predictive advertising, real time bidding, personalized target marketing. We design boards for intelligent advertising based on person seeing the board.

**j) Intelligent HRMS:**

We offer assistance in design of human value acquiring, processing and management. We use deep learning pre-trained models, custom models that help you acquire, retain and sunset resources based on your time and materials available, budget and limitations. We remove any human bias that might make you less competitive.

**k) Smart pricing:**

We offer services for all types of businesses that need to be competitive. We analyze consumer behavior, market trends, economic conditions, asset value, and demand in arriving at right price for your items.

**l) Intelligent field services:**

We assist in system design for planning routes, sequences, required tools, client data, and payments. Integrated with existing ERP systems from SAP, Oracle, Microsoft, Salesforce, we help in intelligent ways of accomplishing work, with more transparency and making best use of available resources, staff, and inventory. We offer solutions that using matching algorithms for matching time, budget, salary paid, and utilization. Our systems analysis taken orders, client data and available resources and offers unique and alternative routes, time and location for dispatch of sales/ field workers.

For more details, contact below:

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